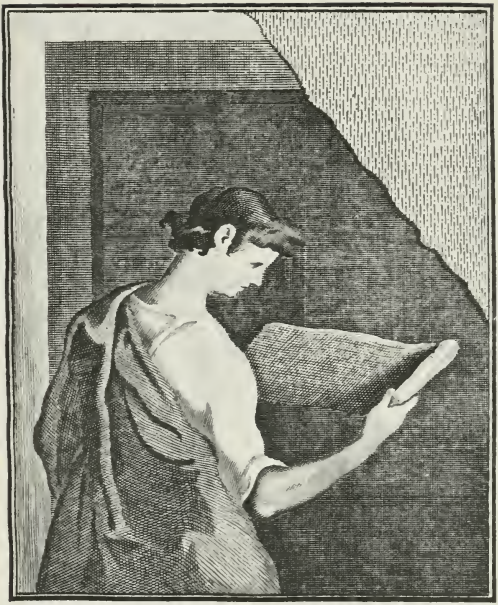

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THE EDITOR's

PREFACE.

THE Arts cannot attain a higher degree of perfection, till more exact enquiries are made concerning every thing which can contribute towards facilitating their progreſs. It ought, therefore, to be the ſtudy of every individual to diffuſe his obſervations, and extend his reſearches, in a country where he can claim a liberal encouragement for Diſcoveries, or the Promulgation of Arts in general. Among thoſe who diſcharge their duty in the moſt becoming manner, the Britiſh Artiſts, and profeſſed Mechanics, are undoubtedly entitled to the firſt rank, as their experiments, and productions, are evident and real.

It is but of a late date ſince thoſe Arts and Trades, which conſtitute the wealth and commerce of *Great Britain*, begin to increaſe their luſtre

luſtre, œconomical order, and neceſſary diſtribution, in this great kingdom.

The preſent work is a faithful compilation of various ſecrets in the refined Arts and Trades: diſcoveries no way unworthy an *Engliſhman's* attention.

The ART of ENGRAVING, in its infant ſtate here, will, if not benefitted, at leaſt be ſettled on a more permanent baſis, by a due obſervation of the directions and receipts contained in this volume.

The various combinations and compoſitions of METALS; the Art of VARNISHING, of making MASTICHS, and CEMENTATIONS; Curioſities in GLASS and PRECIOUS STONES; the MIXTURE of COLOURS, in Painting; the Art of GILDING; DYING WOOD, BONES, IVORY, *&c.* together with the various methods of MOULDING; which will be found uſeful, if not abſolutely neceſſary, towards facilitating the progreſs of thoſe Arts in *Britain*, where taſte and elegance ſeem to claim a proportionable

able ſhare of the public's attention and encouragement.

The other matters are uſeful to thoſe who wiſh to be eaſily accommodated with the polite and uſeful neceſſaries of a frugal life. They are intended chiefly for thoſe who have had few opportunities to learn the proper methods of making the beſt uſe, in ART, of thoſe articles which Nature profuſely laviſhes for the nouriſhment and taſte of domeſtic felicity.

Many of the following Secrets and Receipts ſpring from the firſt artiſts in *France*, *Italy*, and *Germany*, are tranſlated from the *French*. Several eminent artiſts here have given great additions and aſſiſtance towards rendering them eaſy to be underſtood by the moſt common capacity, eſpecially thoſe technical terms peculiar to the various Arts and Trades mentioned.

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SECRETS

IN

ARTS and TRADES.

CHAP. I.

SECRETS relative to the ART of ENGRAVING.

I. *A wax to lay on iron or ſteel.*

TAKE the bulk of a nut of white wax, melt it, and add to it the ſize of a muſquet ball of ceruſe of *Venice*. When both are incorporated, form this compoſition into ſmall ſticks. With them rub your piece of ſteel, or iron, after having previouſly warmed it ſufficiently to melt the wax, which ſpread well over it with a feather. When the wax is cold, trace whatever you will on it, and paſs afterwards, on the lines you have drawn, the following water.

II. *A mordant water to engrave on ſteel.*

1. Take the ſtrongeſt verjuice you can find; alum in powder, and a little dried ſalt, pulveriſed. Mix all together till perfectly diſſolved: then paſs ſome of that water on the lines of your drawing, repeating the ſame till it is ſufficiently deep engraved.

2. Or elſe take verdigreaſe, ſtrong vinegar, ammoniac and common ſalts, and copperas, equal parts. Set all together a boiling for a quarter of an hour: then ſtrain it

through a rag, and run some of that water on your plate. In about half an hour afterwards it will be perfectly engraved.

3. Callot's varnish, of which the composition shall be found hereafter, in the *Chapter on Varnishes*, is an admirable composition to lay on the plate you propose to engrave.

III. *To engrave with* aquafortis, *so that the work may appear like a* basso relievo.

Take equal parts of vermillion and black lead; two or three grains of mastick, in drops. Grind them all together, on marble, with lintseed oil; then put this composition into a shell. Next to this operation, cut some soft quills, and let your steel or iron be well polished. Try first, whether your colour runs sufficiently with your pens; and if it should not, you must add a little more oil to it, so as to have your pen mark freely with it, as if you were writing with ink, on paper. Then rub well your plate of steel with wood ashes, to clean and ungrease it; after which wipe it with a clean rag, and draw your design upon it, with your pen, prepared as before, and dipped into your liquor. If you want to draw birds, or other animals, you must only draw the outlines of them with your pen, then fill up the inside of those lines with a hair-pencil; that is to say, you will cover all the space, contained between the first outlines drawn with the pen, with the same colour, which you will lay with a brush, to preserve all that part against the mordacity of the *aquafortis*. When that is done, let your work dry for a day or two; and when dried, take some fire, made with charcoal, into a chafingdish, and bake over it your colour, by degrees, till it becomes quite brown. Take care notwithstanding not to burn it, for fear you should scale it when you come to scratch, with the point of a needle, those etchings, or places, which you want to be engraved, with the following *aquafortis*.

IV. Aquafortis *for engraving*.

Take verdigrease, roch alum, Roman vitriol, and common

mon ſalt, of each three ounces; pound it into a very fine powder. Have a new pipkin, put a little more than a quart of water, and your drugs, all together. Let them thus infuſe a couple of hours; then place them over a charcoal fire; and when the water has a little ſimmered, take the pot from off the fire, and let it cool, that you may dip your hand in without ſcalding. Then have an earthen cup, with which you take off that water, and pour it over the work you mean to engrave; ſo that it may run freely over all the places which are to be marked, and then off into a pan placed under to receive it. Continue thus to water your work for three quarters of an hour. Then you will pour upon it clear pump water, to waſh off the mud which the *aquafortis* ſhall have occaſioned. You are then to try, with a needle, the depth of the lines of your engraving; and, if not at your liking, you muſt begin again watering it, as before. The only care you are to have, is, that your liquor ſhould not be too warm; for then it would ſpoil the work. It is better to uſe it lukewarm only, and be longer at it.

V. *To engrave on braſs, or copper, with* aquafortis.

You muſt put in your colour more maſtick in drops, and bake it alſo rather more over the fire, after it is laid on your plate; ſo that it ſhould almoſt turn black. And if it be a flat work, as generally are all thoſe on copper-plates, you muſt raiſe around it a border of wax to prevent the *aquafortis*, which you are to pour on it, from running off, and which is to be a ſeparating *aquafortis*, with which you cover the plate to the thickneſs of a crown piece. After it has been thus left covered with that *aquafortis*, for a little while, this becomes green; then is the time to throw it away, and to pour in its place ſome pump water; when you will examine whether the lines be ſufficiently deep or not. If not, pour again freſh *aquafortis* on your plate, and thus you will obtain works of *baſſo relievo* by contrary; that is to ſay, raiſed grounds. You may thus engrave all ſorts of works.

VI. *To engrave prints by* aquafortis.

Take ſome ceruſe; grind it well with clear pump water, and ſize it with iſinglaſs. Lay this compoſition, with a coarſe bruſh, or pencil, on the plate which you want to engrave. When it is dry, draw on it whatever deſign you pleaſe. Or, if you want to counterproof a copperplate print, blacken all the back of your print; and placing that blackened part on your plate, prepared as before, go over all the ſtrokes of your print, with a ſmooth ivory, or wooden point; which will ſtamp the black of the print, in all thoſe places, on the plate. Then you will go again over all the black ſtrokes, which are laid on your plate, with a pen and ink; and taking afterwards a ſteel point, very fine and well tempered, you will etch your plate with it, in following all the ſtrokes marked on it, and pour *aquafortis*, as before directed.

VII. *Another.*

Take white lead, and grind it well with maſtick in drops. Cover your plate with it by means firſt of a bruſh, and then ſmooth it with the ſoft part of a gooſe feather. Let this dry for a day or two; then give a ſecond coat, of this compoſition, over the firſt; and ſpread it with the palm of your hand. When dry, bake it over charcoal, till it comes a little yellow; then draw what you will over it, with a black lead pencil; and proceed afterwards, as before directed.

VIII. *The method of engraving with* aquafortis.

1. You muſt have a very well poliſhed plate, and perfectly clean. Set it to warm over a chafingdiſh, in which there is a charcoal fire. While on it, cover it with a varniſh, either dry or liquid, for there are two ſorts. Then you blacken that varniſh with the flame of a candle, over which you paſs, and repaſs, the plate on the varniſhed ſide.

2. This being done, you have no more to do than to chalk your deſign on that plate, which is infinitely more eaſy

eaſy than to engrave with the graver. For, if you rub the back part of your drawing with ſome ſanguine ſtone (red chalk) or any thing elſe, and lay it afterwards on your plate, to trace it with a point, the ſanguine, which is on the back of the draught, will eaſily ſet off on the varniſh. So that you may follow afterwards all the lines of the deſign, and be infinitely more correct in all the turns, and the expreſſion of the figures. This is the reaſon why all the painters who have their own works engraved, take the trouble of drawing alſo the outlines of their figures, that the ſpirit and beauty of the deſign may be preſerved. Indeed it muſt be confeſſed, that we always diſcover a great deal more art in thoſe pieces which are engraved with *aquafortis*, than there is found in them that are done by the graver. And, even in many of theſe, the *aquafortis* is often employed to ſketch lightly the *contours*, or outlines of the figures, and to have them more correct.

3. True it is, that it is ſometimes found neceſſary to touch a little over with the graver certain parts which are not ſtrong enough, or that the *aquafortis* has not eaten in ſufficiently. For it is not eaſy, in a great plate, to get all the ſeveral parts ſo proportionably, and *a propos*, eaten in, as there ſhould be nothing to find fault with.

4. It is not enough for an engraver to work with the point of his needle, or ſcooper, in all the different places of his work, with the ſtrength and delicacy neceſſary to make appear, as he wants them to be, the moſt remote and the neareſt parts. It is again requiſite that he ſhould take care, when he comes to put the *aquafortis* on his plate, it ſhould not bite equally every where. This is prevented, as follows, by a mixture of oil and tallow, which you will drop in it, from a lighted candle.

5. To this effect he muſt have a framed wooden board, overlaid with wax, on which he fixes his plate a little ſlant way; then pours *aquafortis* on it, ſo that it may only paſs over it, and run into an earthen pan, placed under to receive it. Therefore he takes care to examine when thoſe parts, which are not to be ſo deeply eaten in, have received a ſufficient quantity of *aquafortis*; in which

caſe, taking off his plate, he waſhes it with pump water, by pouring it only over, dries it gently before the fire, then covers the moſt remote parts, and them which he wants to preſerve weakeſt, with the abovementioned mixture of oil and tallow, that the *aquafortis* ſhould not act, any more, on thoſe places. Thus, covering at ſeveral times, and as much as he pleaſes, ſuch places of his plate as he wants to keep not ſo ſtrong as others, it reſults that the figures, which are forwards in the picture, are conſtantly every time waſhed with the *aquafortis* which eats in them, till he ſees they are ſufficiently engraved, and according to the degree of ſtrength which he is deſirous of giving them.

6. That ſort of *aquafortis* we have mentioned and deſcribed in this chapter at the article of the *water for engraving on iron*, and which is compoſed with verdigreaſe, vinegar, common and ammoniac ſalts, and copperas, is alſo made uſe of to engrave on copper, in pouring it on the plates, covered either with hard or ſoft varniſh, and ſcratched, or etched, agreeably to the deſign you intend to engrave on them.

7. As for what concerns the refiner's *aquafortis*, commonly called *white water*, it is never uſed but upon the ſoft varniſh, and never as the former, which is called *green water*, by pouring it only over the plate, and letting it run off into a pan under it. A border of wax muſt be made round the plate, on which, this being laid flat upon a table, ſome of that *white water* is poured, after having previouſly tempered it more or leſs with a proportionable quantity of common water, which is called *pickling*.

IX. *To engrave on wood.*

You begin by preparing a board, according to the ſize and thickneſs you want it, and finely poliſhed on the ſide it is to be engraved. The ſort of wood which is generally choſen for ſuch a purpoſe, is either pear-tree or box. And, of the two, this laſt is even ſtill preferable, both on account of its being of a ſuperior hardneſs, and alſo leſs liable to be worm-eaten. On that board you draw

draw firſt your deſign, ſuch as you want it to appear in printing. They, who have not the talent of drawing, as there are a great number who make uſe of the very drawing you give them, which they paſte on their board, by the right ſide, with a paſte made of good flour, water, and a little vinegar. You muſt take care that all the ſtrokes of the drawing ſhould touch well, and ſtick on the wood; and, when the paper is very dry, wet it gently, and with the tip of your finger rub it off by degrees, ſo that the ſtrokes only of the drawing ſhould remain on your board, as if you had drawn it with ink and a pen. Theſe ſtrokes, or lines, ſhew all that you are to ſpare, or preſerve; all the reſt you are to cut off and ſink down with delicacy, by means of a ſharp and well-tempered pen knife, ſmall chiſel, or *gouet*, according to the ſize and delicacy of the work, for you have no need of any other tool.

X. *To engrave on copper with the graver.*

1. When the plate, which is to be of red copper, is well poliſhed, you draw your deſign on it with either the black lead ſtone or a ſteel point. When that is done, you have no further need of any thing but a ſharp and well tempered graver to cut in, and give more or leſs ſtrength to certain parts, according to the ſubject, and the fine figures you execute.

2. You muſt alſo have a certain tool of ſix inches long, or thereabouts, one of the ends of which, called a Scraper, is made in the form of a triangle, ſharp on each edge, with which you ſcrape on the copper when you want it. The other end, called a Burniſher, has very much the ſhape of a fowl's heart, a little prolonged by the point, round and ſlender. This ſerves to poliſh the copper, to mend the faults, and ſoften the ſtrokes.

3. In order to form a better judgment of your work, you muſt now and then, as you proceed on, make uſe of a ſtump, made with a piece of an old hat rolled up and blackened, with which you rub your plate, on the place you are working, which fills the ſtrokes with

black, and makes you see better the effect of your work, as you go. You must be provided likewise with a leather cushion, on which you lay your plate, while you engrave it.

4. We shall not give any further account of the art of engraving than this short epitome, and we shall not attempt to enter into a more particular detail of the various and curious circumstances attending this noble art. They whose curiosity on that subject will prompt them to be more particularly acquainted with it, may amply satisfy themselves, by taking the trouble to read the treatise which *Abraham Bosse* has purposely composed, on the art of engraving.

XI. *To engrave on steel or iron; such as blades of swords, knives, &c.*

1. Take one part of linden-tree coals, two of vitriol, and as much of ammoniac salt. Grind all together with vinegar, so as to obtain a soft paste of it. Then, whatever you want to engrave on steel or iron, begin first by sketching it with vermillion diluted with lintseed oil, which you shall have put a-drying, to use it afterwards like a pencil. When your drawing is done, cover it with the abovementioned paste to the thickness of a finger. This composition must be applied warm; and the more warm it is, the sooner the work will be engraved; though you must have care not to burn it. When this composition is well dry, take that powder off, and wash well the engraved place.

2. You may to the same effect take Spanish verdigrease, or common salt, one part; and while you pound it in a mortar, add some very strong vinegar, and proceed as above.

3. Some make use of vitriol, alum, common salt, and linden-tree coals, which they prepare and use as above directed.

XII. *A water to engrave on iron or copper.*

1. Take Spanish verdigrease, sublimate mercury, vitriol, and alum, equal parts. Pound it all well in a mortar, and put

put it in a glaſs veſſel, ſufficiently large, with a proportionable quantity of the ſtrongeſt diſtilled vinegar. Let the whole thus infuſe for twelve hours, ſtirring it often. Draw next what deſign you like, on a coat of wax laid on your iron, or copper, either with a ſteel point, or factitious ocher, mixed with lintſeed oil. Then paſs ſome of your liquor on the places you ſhall have etched with a needle or ſteel point, in following carefully the ſtrokes of your deſign, if it be firſt drawn on wax. For, in the uſe of this method, you muſt not fail to begin by covering firſt your plate with it, as we ſaid elſewhere. You may again lay on your deſign, prepared as we ſaid, ſome ſublimate alone, finely pulveriſed; then pour over it good ſtrong vinegar, which you will let lay for the ſpace of half an hour, after which waſh it with cold water, and clean off your plate.

XIII. *Another more mordant water.*

1. Take Spaniſh verdigreaſe, *alumen plumeum*, ammoniac ſalt, tartar, vitriol, and common ſalt, of each a quarter of an ounce. When the whole is well pounded, and mixed with the ſtrongeſt vinegar, let it thus remain for the ſpace of half an hour. If you want to have your deſign raiſed, make it with factitious ocher and lintſeed oil, well ground and mixed together, and let it dry perfectly. Then ſet the aforeſaid water a-warming over the fire, in an iron pan well tinned with lead; and, leaving it on the fire, take your ſteel plate, and holding it in one hand over the pan, take with the other of the warm liquor, with a ſpoon, and pour it on your plate; ſo that by falling again into the pan, you loſe none of your water. Continue ſo doing for a quarter of an hour's time; taking care, however, your water ſhould not be too warm, leſt it ſhould ſet a-running the oil which is mixed with the varniſh. When this is done, rub the aforeſaid compoſition with pot aſhes, mixed with an equal quantity of quick lime in powder, and you will find that what was covered with the compoſition will be preſerved, and raiſed from the other parts of the plate which are eaten down.

XIV. *An* ardent water *to engrave ſteel deeply, or even eat it off entirely.*

Take two quarts, or thereabout, of thick black wine, the oldeſt and the beſt you can find. Diſſolve into it quick lime, and brimſtone in powder, wine tartar and white ſalt, of each equal parts, and as much of the whole as there can poſſibly be diſſolved in that quantity of wine. You ſhall next put all that mixture into a *cucurbit*, or rather in a *retort* well luted. Adapt to it a *bolt-head* to ſerve as a receiver. Lute well the joints, then give it the heat gradually. There will diſtil a very mordant water, which you may keep in a phial, carefully ſtopped, for uſe.

CHAP.

CHAP. II.

SECRETS relative to METALS.

I. *Tranſmutation of iron into the fineſt German ſteel.*

1. TAKE clean ſoot one pound; oak wood aſhes twelve ounces, and four of pounded garlicks. Boil all together in twelve pounds of common water, reduced to four pounds. Strain this, and dip in it the iron pegs, which you will afterwards ſtratify with the following cement.

2. Take burnt wood coals, otherwiſe called *cokes*, and quick lime, of each three pounds; ſoot dried, and calcinated in an iron pan, one pound; decrepitate ſalt, four ounces. Make of this and your iron ſeveral beds alternately, one over another; and having well luted the veſſels in which you ſhall have made thoſe beds of iron and cement, give them a reverberating fire, for three times twenty-four hours, and the operation is done.

II. *To make tin.*

Take a diſcretionable quantity of rye-bran, quite pure, boil it a minute or two in vinegar, then add to it a little water, and in that ſame inſtant plunge your ſheets of black iron; then take out of the fire, and ſtop well, the veſſel. Let your iron reſt there and ſoak for twenty-four hours, after which time take off your iron ſheets; ſcore them well with the very bran with which they were a-ſoaking, then rub them over a little with grindſtones. This being done, make them ſoak again in a water wherein you ſhall have diſſolved ſome ammoniac ſalt, whence having taken them off, ſet them a draining, and rub them afterwards with rye-bran, and your *tin* will be done.

Obſerve that the veſſel in which you lay your ſheets ſoaking, muſt be large enough to receive them in their full intended ſize.

III. *To break an iron bar as big as the arm.*

Take melted ſoap, with which you will rub your iron bar at the place where you would have it break. Then with any thing take off and clean away part of that unction, in the middle of it, about the width of half-a-crown. Then take a ſponge, dipt into ardent water of three diſtillations, bring it round the bar, and in ſix hours it will break.

IV. *Another for the ſame purpoſe.*

In two pounds of *aquafortis*, diſſolve orpine, ſulphur, regal, and verdigreaſe, one ounce of each; of quick lime killed in two ounces, of triple diſtilled vinegar one ounce. Place the whole in an alembic, with one ounce of ſaltpetre, and two of ammoniac ſalt; and, having given a gradual fire to it, you will take the ſpirits which ſhall have diſtilled, and put them again over the *fæces* or reſidue, with an addition of two ounces of pulveriſed arſenic. Diſtil this a-new, and keep what ariſes from it. In this, if you dip an handkerchief, and turn it round an iron bar, in three hours time it will break with the greateſt eaſe. You muſt only take a great care to guard yourſelf againſt the fumes, in diſtilling this compoſition.

V. *To compoſe a metal of a gold colour.*

Take refiner's copper ſix ounces; melt it in a crucible; add one ounce of calaminary ſtone; half an ounce of tutty, and one of *terra merita*, in powder. Give to this a melting fire for five or ſix hours running, then take off the crucible from the fire. Put this compoſition in powder, and add to it two ounces of common mercury, ſix of ſea-ſalt exſiccated, and a ſufficient quantity of water. Set the whole a-boiling, until there appear no more mercury. Then put the matter into a crucible, and place it between two fires of kindled coals, avoiding carefully the breathing

breathing of the fumes. Give this a melting fire, for two hours, then wash the compoſition in water, till this runs off quite clear. Set this again in a crucible; and, when melted, pour it into an ingot. This will give you a metal, of the moſt beautiful gold colour, which you may make uſe of for plates, buckles, ſnuff-boxes, cane-heads, &c.

VI. *Another compoſition of metal.*

Take a reaſonable quantity of the leaves of *Perſicaria urens*, called *Arſmart*, or vulgarly, Water-pepper, which you will dry in the ſhade. Melt in a crucible ſix ounces of refiner's copper, and when melted, throw in one ounce of powder of the arſmart's leaves, or even half an ounce; then cover the crucible with an iron lid, and keep this matter in fuſion for the ſpace of one hour, after which you caſt it in an ingot. This proceſs will give you a metal which (except the colour that artiſts can at any time give it by an induſtry well known to them) has otherwiſe all the qualities of gold. The only defect is, that it cannot bear teſting, and that it muſt therefore ſerve only to ſupply common copper which ruſts eaſily, and has not ſo much brightneſs. It may be uſed for candleſticks, and other ſimilar works.

We thought it was proper here to give this receipt, as it is to be wiſhed we could make ourſelves thoſe metallic compoſitions, which we import from Holland, and other countries.

VII. *To diſſolve gold in your naked hand.*

Diſtil hart's blood juſt killed; and, after having drawn the ſpirits *per aſcenſum* in *balneo-mariæ*, cohobate again three different times. At the third diſtillation you ſublime all the fixt; and, when done, lute well the veſſel, and keep the liquor for uſe. This liquor, carefully preſerved, will diſſolve gold in the naked palm of your hand.

VIII. *How to give ſome perfection to imperfect metals.*

It is well known that gold is the moſt perfect of metals.

tals. After this comes silver, the principles of which are very near pure, and equally proportioned between them as those of gold. All other metals are reckoned imperfect and crude. Among them however, that which approaches nearest to perfection, is copper. This therefore may easily be purified, by being delivered of all the superficial and combustible sulphurs with which it is loaded. And whoever will proceed, according to the following direction, will not fail to obtain it.

1. Take what quantity you please of copper. Set it in a crucible over a melting fire. While melting in that crucible, throw in at different times some tutty-powder mixed with equal parts of refined saltpetre. Then, the detonations being made, take the crucible out of the fire and let it cool. Break the crucible and separate the scories from the regulus. Put the copper regulus into another crucible, and reiterate the same operation three times, till the copper is extremely fine and true gold colour.

2. Now, if you set it a melting for the fourth time, and project on it ficaria or hydro pepper leaf powder, you will render it still more perfect; and you might thus purify it so far, as to give it, at last, all the qualities of gold.

3. Whoever will know how to purify brass from its foreign sulphur, will turn it likewise into a very fine silver.

4. You may also whiten lead; and, giving it the hardness of silver, render it similar to it.

5. Pewter and quicksilver may likewise be purified, in separating from this last its arsenical sulphurs, and fixing it by the supplement of a fixt, metallic, incombustible and solary sulphur. The other may, by taking off from it its superfluous saline part, and uniting its mercurial one to the true metallic sulphur. But this we cannot expect to attain, if not previously versed in the method of dissolving, analysing, and dividing or separating, and then re-embodying again metallic substances; and this is known by none but the sons of the art, the adepts alone.

IX. *To*

IX. *To melt metals in the ſhell of a nut, without burning it.*

Take ſaltpetre two ounces; ſulphur half an ounce; oak, walnut-tree, or any other very dry wood ſawduſt half an ounce. Let the ſawduſt be ſifted very fine, and the ſaltpetre and ſulphur reduced to an impalpable powder. All this being well mixed together, fill the ſhell of a nut with it to the brim; then lay over it a piece of gold, ſilver, or any other metal you pleaſe; and, having covered it again with the ſame powder, ſet the fire to it, and you will ſee that the metal will melt, and remain at the bottom of the ſhell.

X. *To increaſe the virtue of a loadſtone.*

You muſt let it ſoak, for forty days, in iron oil.

XI. *To reſtore gold to its weight, after it has loſt it in regal water.*

Put a bit of *tortoiſeſhell* to ſoak, for ſome time, in regal water. Then put your gold in it, and by that means, it will recover its loſt weight.

XII. *To operate the tranſmutation of ſilver into gold.*

1. Get a new iron pan to grow red hot upon a trivet, and then put two pounds of lead in it. As ſoon as this is melted, throw over it, by degrees, ſome good ſaltpetre pulveriſed. This will melt likewiſe. Keep it thus in fuſion till it is at leaſt half diſſipated. Should it take fire during that time, it does not ſignify, for it hurts nothing, and the more concocted over again the ſaltpetre is, the ſtronger is the oil.

2. Let this cool, divide the ſaltpetre from the lead. After having well pounded it on a marble ſtone, carry it into the cellar. There it will fall into *deliquium*, which you will pour into a cucurbit, with double its weight of true French ſpirit of wine, added by little and little at a time; then diſtil by a ſlow fire. Grind on marble, as before, what remains in the cucurbit: and, being turned into *deliquium*, put it again into the cucurbit, with ſome more

more ſpirit of wine. Take off theſe diſſolutions and cohobations, repeating the ſame proceſs over again as before, till the ſaltpetre remains at the bottom of the cucurbit reſolved into a true oil, which congeals itſelf no longer. and this will procure you what is called the Fix-balm.

3. Next to that operation, you will make an *aquafortis* with equal parts of ſaltpetre, dried vitriol, and roch-alum; and, before you put the receiver to the cucurbit, add ſteel-filings, antimony, verdigreaſe, in ſubtile powder, tutty and cinnabar, of each half an ounce, or one ounce, according to the quantity of *aquafortis* you want to draw. Cohobate the ſpirits ſeven times over, upon the *fæces*, which you will grind each time on a marble table.

4. Diſſolve one ounce of ſilver in three of this liquor; and, on that ſolution, ſtill, drop by drop, one ounce of nitre oil in a bottle made like the hour glaſſes, which after the operation muſt be at moſt only half full, and which you will cover with another inverted, ſo that the neck of the under one ſhould get into that of the upper one. Or elſe, put it in a mattreſs with a long neck, which you will ſeal hermetically; but, if you make uſe of bottles, take care to lute well the joints. Place this over hot aſhes, and plunge it in them to the height of ſix inches. Give under this a lamp fire, which ſhould not reach the matter by three fingers diſtance. You will get every day to the amount of a ſilver pennyweight of ſilver fixed into gold. And, when the whole ſhall have been fixed thus, day after day, the *aquafortis*, which before was green as an emerald, will become as clear as pump-water. Let the compoſition cool, and divide the water from the oil, which will never be the worſe for uſe, and muſt therefore be preſerved. At the bottom of the veſſel you will find the ſilver fixed into gold.

XIII. *Fixation of gold into ſilver.*

1. Sublime, on a ſand fire, ſome arſenic, with an equal weight of decrepitate ſalt. Take the middle and cryſtaline

cryſtaline matter which ſublimates, rejecting the ſubtile flour which riſes on the head, and the dregs which remain in the bottom. Sublime over again this cryſtal, and reiterate ſo many times as neceſſary, that no flour ſhould longer ſublimate.

2. Calcinate ſome ſilver with mercury, with which amalgamate it, and this as many times as you may find neceſſary, that the water in which you waſh your ſilver, after the diſſipation of the mercury by means of fire, ſhould run as fair and clean as when you poured it over it.

3. Take one ounce of this calcinated ſilver, and four of the aforeſaid arſenic; ſublime the whole ſo many times as neceſſary, that nothing ſhould aſcend any more. This ſublimation may eaſily be performed in a mattreſs laid on its ſide, which you muſt turn ſo as to put always underneath what is ſublimed above. By means of ſuch an induſtrious practice, you avoid the neceſſity of breaking your mattreſſes every time you want to re-ſublime what was already ſublimed. At laſt the matter turns into a ſtone, which having pounded, put on a digeſting bath, till it is all reduced into a fixed oil, which you know to be done by the tranſparency of the veſſel.

4. Take four parts of mercury, and one of that oil. Put firſt the mercury into the crucible, and, afterwards, this fixt oil. Give a gradual fire, till all the compoſition be reduced into a lump, which adheres to the crucible. Take it out and teſt it; you will find it to be the fineſt ſilver in the world.

XIV. *To extract mercury from lead.*

Take pearl aſhes one pound; vine aſhes four; quick lime one; and pebbles calcinated two. Make a ſtrong lye of the whole with diſtilled vinegar. Diſſolve in this two pounds of lead; and, when the lye is become white, throw in ten ounces of borax. When this is diſſolved, throw the whole into a retort, and diſtil it with a gradual fire. You will get, into the receiver, ten ounces, at leaſt, of quickſilver.

XV. *Another*

XV. *Another mercury from lead.*

Take lead filings one pound; ammoniac salt four ounces; bricks pounded into a powder, three pounds. Distil this composition in a retort, on a gradual fire. The receiver must be very large, half full of water, and the fire must be continued for twelve hours, pushing it by degrees, to the very last.

XVI. *Permutation of lead into silver.*

Take fine lead; calcine it with common salt, or else with that sort of salt which is extracted from the dregs, *fæces*, or *caput mortuum* of saltpetre and vitriol calcinated both together. Soak the whole warmly with oil of vitriol, till you make it come into an unctuous paste. This put in a pot, or crucible, well luted, and placed in a pan full of sand, with which you will cover it over entirely. Make under this a digesting fire; that is to say, such a fire as is necessary to warm the sand; keep it so for ten days, then take off your matter and test it. Cut off *one hundred and five pounds* weight of lead, you will draw *five marcs* or *two pounds and half* weight of silver, capable to stand the test.

XVII. *Fixation of saltpetre.*

Melt some lead in a crucible, and project on it pulverised nitre, reiterating the projections in proportion as the matter fuses, till it is entirely melted.

XVIII. *Transmutation of iron into copper.*

Iron is easily changed into copper by means of the vitriol. To do this, put your iron, *stratum super stratum*, in a descensorium, and set it over a strong blast fire, pushed by bellows, till the iron melts and flows into copper. You must not forget, when you have made your beds of vitriol, to water them a little over with vinegar saturated of saltpetre, alkaline, and tartar salts and verdigrease.

XIX. *Another*

XIX. *Another to the same purpose.*

Pound some vitriol in powder, and distil the spirits from it by means of the retort. Replace the spirits on the *caput mortuum*, then plunge and extinguish in them some red hot iron laminas, or filings; and, by little and little, the iron will turn into copper.

XX. *Another.*

Dissolve vitriol in common water; pass it through filtering paper, then evaporate the water unto a *pellicula*, and put it in the cellar, for one night, and you will obtain some green crystals. Redden them in the fire, then dissolve them three or four times in distilled vinegar, drying them every time, till these crystals become red. Dissolve them again in the same vinegar, and extinguish in it some red hot iron laminas, filings, or any other iron rubbish, they, and every one, will, by these means, turn into a very fine copper.

XXI. *To preserve the brightness of arms.*

Rub them with hart's marrow. Or else, dissolve some alum powder with the strongest vinegar you can find, (that of *Montpellier*, which serves to make their famous verdigrease, is the fittest) and rub your arms with it. By these means, they keep for ever bright and shining.

XXII. *To manage steel so, that it may cut iron as it were lead.*

Draw, by an alembic, the water which will come from a certain quantity of earth-worms; join with this water an equal quantity of horse radish juice. Then temper, four or five times, in this liquor, your iron kindled red hot. That sort of steel is made use of for knives, swords, and other instruments, with which you may cut iron with as much ease as if it were lead.

XXIII. *To*

XXIII. *To soften steel.*

Take a discretionable quantity of garlick, rob them of their coarsest peel, then boil them in oil of nuts, till reduced into an *unguentum*. Cover well your steel all over with that composition, to the thickness of half a crown. When this is done, put your steel, thus covered, in the forge, in the live coals, and it will become soft. To restore it afterwards to the temper, called by artists *red cherry colour*, you must, after having made it red hot, plunge it in the coldest water.

XXIV. *To extract mercury from antimony.*

Take antimony and decrepitate salt, of each one pound. Mix them together, and put in a retort of two quarts. Set the retort on the bare fire, or on the gradual sand fire. Let the beak of the retort be in the water, and at the bottom of that vessel, wherein the water is, you will find the running mercury of antimony.

XXV. *A magical mercurial ring.*

Take verdigrease half a pound, and an equal quantity of copperas. Pulverise each of them separately, and put these powders into an iron pan, which hath never been used before for any thing else. Boil the whole, for about two minutes, in very strong vinegar. Then throw into the pan half a pound of crude mercury, which you will incessantly stir with a wooden spatula. Begin to boil first by a slow fire, and never cease to stir the whole well, for fear of the adhesion of mercury. In proportion as the vinegar sinks, you may add more, not exceeding, however, the quantity of half a pint, or thereabouts. When this has boiled about a couple of hours, the matter will remain in a lump at the bottom of the pan. Let it cool with the small quantity of vinegar which shall remain after the ebullition, then throw it into a large pan of cold water. Handle this lump well in that water, in order to purge it from all the *munditiæ*. Throw that first water away, and put clean water in, and do the same again and again, keeping handling the matter well in

in your waters, till the laſt remains clear as rock water. When your mercury is thus well fixed, put it in a clean piece of linen to take off the ſuperfluous parts; and what remains well fixed after this ſecond trial, you muſt extend on a ſheet of white paper, on which, having flattened it quickly, and cut as haſtily, for fear it ſhould grow too hard, into ſmall bits of the form and ſize you like, you expoſe it to the dew of one night, from the evening to the morning, and then you will find it as hard as iron.

XXVI. *To melt the aforeſaid mercury.*

Take Alexandrian tutty, and *terra merita*, of each half a pound, ſeparately pulveriſed and mixed afterwards together. Stratify your bits of the above mercury, making the firſt and laſt *ſtrata*, or beds, with the powders, and a little thicker than the others. Cover your crucible with another, and lute them ſo well that there ſhould no chink remain, which you will examine well after having dried them in an oven. When perfectly dry, place your crucibles in a gold or blackſmith's furnace, and ſurround them well with live coals every way, by the ſides, top and bottom, which you will make blaſting for a quarter of an hour; and puſh by ſtrength of bellows during half an hour, then let them cool gradually in the fire till the next day; when, taking off your crucible, you will find your matter turned into a gold colour. Throw it into a pan of water, and waſh it well till the water remains clear. The whole being granulated, put in a ſmall crucible with half an ounce of borax, and melt it as you would gold or ſilver, then throw in it an ingot. With this matter you will make your rings, in drawing this metal through the wiring bench, or otherwiſe.

XXVII. *The virtue of thoſe rings.*

They ſtop the colds in the head, ſhew the diſorders one may be affected with, particularly in thoſe well known monthly diſeaſes of women. At ſuch times the ring turns of a dull red colour. They are alſo very uſeful in killing the worms in ſmall children, if you make them boil in a varniſhed new pipkin, with a glaſs (or four ounces) of water, reduced to a third, and drank faſting.

XXVIII. *A*

XXVIII. *A fixation of copper, which will be found to yield ſix ounces out of eight, on the teſt.*

Take two ounces of fine pewter, which melt in a crucible, adding gradually to it, after it is melted, an equal quantity in weight of flour of ſulphur. When all is calcinated, and while ſtill a little warm, add again to it half an ounce of common purified mercury, ſtirring continually with a ſpatula, till the mercury diſappears entirely. There will come a powder, of which if you project one, on four ounces of red copper in fuſion, then ſtir and caſt in ingots, you may obtain the promiſed advantage.

XXIX. *To whiten copper ſo as to make very fine figures with it.*

Take five parts of copper, which you will melt in a crucible, then throw in one part of zinc. As ſoon as the zinc is in it, take it off from the fire, and ſtir the matter a little with an iron rod, then caſt it in the moulds of your figures. They will look like ſilver caſted ones.

XXX. *To give the fineſt colour of gold to copper, in order to make ſtatues, or other works with it.*

Take one pound of copper, melt it in a crucible, then throw in it one ounce of Alexandrian tutty reduced into a ſubtile powder, and mixed with two ounces of bean-flour. Take care to keep ſtirring this matter, and to guard yourſelf againſt the fumes. After two hours of fuſion, you will take this compoſition off, and waſh it well, and put it again in the crucible with the ſame quantity as before of the ſame powders. When melted, for this ſecond time, you may take it off, and caſt it in the moulds you propoſe, and had prepared for it.

XXXI. *To imitate tortoiſeſhell on copper.*

Rub copper laminas over with oil of nuts, then dry them over a ſlow fire, ſupported by their extremities, upon ſmall iron bars.

XXXII. *To*

XXXII. *To perform the same on horn.*

Make a cold dissolution of auripigment in filtered lime water; then, lay some of this liquor with a brush on your comb or other horn work. Reiterate this, if you find it has not penetrated enough the first time, and turn it, to do the same the other side.

XXXIII. *To soften metals.*

Take saltpetre and camphire equal parts. Dissolve them in a lye made with two parts of oak-wood ashes and one of quick lime. Pass this solution through a filtering paper, and vaporise it over a slow fire in a glass vessel. There results a borax, which, thrown in metals while in fusion, softens them perfectly.

XXXIV. *To wash brass figures over with silver.*

Take one ounce of *aquafortis*. Dissolve in it over a moderate fire one drachm of good silver cut small, or granulated. This silver being wholly dissolved, take the vessel off from the fire, and throw in it as much white tartar as is required to absolve all the liquor. The rest is a paste with which you may rub over any work made of copper, and which will give it the white colour of silver.

XXXV. *To operate the transmutation of iron into steel.*

Take beech and willow, burn them together. When in coals, extinguish them, before they are consumed, with water, or rather, with chamber lye. Pound them well, and sift them through a very fine sieve. Then burn likewise ox horns, and prepare them the same way. Sift well also soot, vine ashes, burnt shoes ashes, and pomegranate shell powder, putting aside and separately each drug by itself, and mix them afterwards, when used, in the following proportions.—Coals twelve pounds; horns ten; shoes, vine, soot, and pomegranate, of each equal quantity, three pounds, all well mixed together. To make *one hundred* pounds weight of steel, there is required *one hundred and twenty pounds* weight of good, soft Spanish iron, not streaky; to which if you give the aforementioned

mentioned doſe of the ſaid powders, prepared as directed, and put to the fire, for the ſpace of forty-eight hours, you will get the beſt ſteel which can be had.

XXXVI. *Another receipt for the ſame.*

1. Take one buſhel of beech coals pulveriſed and ſifted; alder's coals, thus prepared, one peck; vine aſhes and ſoot, both well pulveriſed and ſifted, equal parts, half a peck. Mix well theſe powders, and ſtratify your iron bars with them in a crucible well luted; then give a good fire for twenty-four hours.

N. B. Obſerve that you muſt take care to uſe new, and not floted wood, to make the ſaid aſhes.

2. If you want to have your ſteel white, you muſt add to all the above powders one peck of juniper-wood aſhes.

3. If you want it purple, you muſt make a lexiviation of vine and ſhoes aſhes, ſoot and garlick, well pounded, equal parts; and a ſufficient quantity of water to make the ſaid *bullitorium*, in which you will ſteep, cold, your iron bars before you cement them.

4. You muſt proportionate the quantity of windholes, in each kiln, to the quantity of bars, and of crucibles, for which you intend to fit it.

5. The *ſtratum ſuper ſtratum* ought to be made an inch, or an inch and a half inch thick of powder to each bed.—The bars ought to be ranged croſs way one over another; and large crucibles are to be preferred to ſmall ones.—You muſt take care to have them ſo well luted, as not to allow the leaſt air to find its way in; for there would reſult an intire miſcarriage of the whole operation; and beſides, your powder would hence loſe all its virtue.—Should you likewiſe let it get air before you make uſe of it, it would become quite dead and flat. Therefore, you are cautioned to keep it always very cloſely confined, in well-ſtopped veſſels, of whatever kind they may be.—That which comes off from the crucible, after the operation, is not worſe for having been thus in uſe. It wants therefore, nothing but an additional ſupply of freſh powder joined to it, to make up what is loſt, or diminiſhed, by

by the frequent handlings of it, in taking it out, and putting it in the crucibles again.

6. The kiln ought to be wide by the inferior part, and go narrowly towards the top, which muſt end in a conical form. By ſuch means, the heat contracted becomes ſtrong, and acts with infinitely more power.—Neither muſt you neglect to have it ſo conſtructed as to be provided with an aſh-hole, or a place underneath wherein the aſhes may fall; and ſeveral openings to let the wind eſcape.

† *An eſtimate of the coſts, and profits, of ſuch an operation in* France.

The thouſand weight of iron, in bars, flat on one ſide, coſts about *ſixty livres*. Two thouſand being requiſite, at a time, for one ſingle operation, makes *one hundred and twenty livres*, or, *five pounds* ſterling.

Ten crucibles this will employ; *ten livres*.

Powders for the two thouſand; *forty livres*.

For two men to ſit up, and watch, in order to keep up the fire; *four livres*.

To prepare the ſteel, after it is out of the crucible, and render it marketable; *twenty livres*.

All the expence amounts to *two hundred livres*, or *eight pounds eight*, or, *ten ſhillings ſterling*, or thereabout. Iron, thus turned into ſteel, whether white or purple, comes on computation, to two *ſols*, or one penny, a pound; which makes *one hundred livres* per *thouſand* weight.—Thus, the two thouſand weight, which may be made in the ſame kiln, every week, comes to *two hundred livres*.

If you ſell your ſteel, on the footing of *ſix ſols* per pound, there is clear profit *four hundred livres* a week; which, in a year, would make 20, 800 *livres*—Now you may, on this calculation, have as many kilns as you pleaſe; and each kiln may have a kilnful every week.

XXXVII. *To take immediately ruſt from iron.*

You muſt rub your iron with a piece of rag ſteeped into oil of tartar *per deliquium*.

XXXVIII. *To obtain good silver from pewter.*

1. Take quick lime made from rock or transparent pebbles, and one pound of common salt. With those two ingredients make a strong lye, which you will evaporate on the fire to the reduction of one third part of what it made before. Next, melt in a crucible two pounds of pewter, to which, after fusion, you will add one pound of *hæmatites*. The whole being well incorporated and melted, throw it in part of your aforesaid lye; and, when quite cold, melt it again, and throw it again into new lye, repeating the same process for seven different times, and using fresh lye, prepared as above, every time.

2. The next operation is to take one ounce of ammoniac salt, an equal quantity of borax, eight scruples of auripigment, reduce them into a very fine and subtile powder, and being mixed together, incorporate them into a paste with the whites of two new-laid eggs, and put all together with the pewter, ready prepared as before mentioned, in a crucible. When all is in fusion, continue the fire for one hour; then take off the crucible. There you will find your silver, fit to stand the test of all the assayers.

XXXIX. *To soften iron.*

Take half an ounce of tartar; two of common salt; and two and a half of verdigrease. Mix all together, and expose it in a porringer to the dew of nine nights running. This will turn into water, in which, when red-hot, you may kill your iron.

XL. *To melt iron so that it will spread under the hammer.*

Take equal quantities of lime, tartar, and alkali salt. Pour over it a sufficient quantity of cow-piss, to make a thick pap with it, which you will set a drying in the sun, or before the fire. Make an iron red hot in the fire; then, plunge in that matter. You may afterwards melt it as you would silver; and then work it in the same way when cold.

XLI. *To*

XLI. *To give iron a temper to cut porphyry.*

Make your iron red hot, and plunge it in diſtilled water from nettles, acanthus, *and piloſella*, (or mouſe-ears); or in the very juice pounded out from theſe plants.

XLII. *To ſoften all ſorts of metals.*

Take ſublimated mercury, euphorbium, borax, and ammoniac ſalt, of each equal parts pulveriſed. Project ſome of that powder over any metal, when in a ſtate of fuſion, and you will obtain the deſired effect of making it ſoft.

XLIII. *To ſoften a ſophiſtic metal.*

Take black ſoap and common ſalt, of each two ounces; human excrements dried and pulveriſed, four ounces; roch alum an equal quantity, and nitre ſalt, half an ounce. Incorporate all together in a pan, over the fire, with bullock's gall; keep ſtirring it till you feel no longer any ſaline particle. Then take off the pan from the fire, and let the compoſition cool. Of this you may throw ſome into the crucible in which your metal is in fuſion.

XLIV. *A good temper for arms.*

Take tythimalus, or ſpurge; roots of wild horſe-radiſh, bryonia, and purſlain, of each equal quantities. Pound all together, ſo that you may get at leaſt one pound of juice. Add to this one pound of red haired child's water; ſaltpetre, alkaline, gem and ammoniac ſalts, of each one drachm. When you have mixed all well together in a glaſs veſſel cloſe ſtopped, bury it in the cellar, and let it there lie for twenty days. Then bring it up again, and put it in a retort, to which you will adapt and lute well its receiver, and begin to diſtil by a gradual fire. Now when you want to get arms of a good

temper, you have only to plunge them in this diſtilled liquor, after having previouſly made them red hot in the fire.

XLV. *Another very hard temper.*

Take nettle juice, bullock's gall, child's water, or ſtrong vinegar, and a little ſalt. Incorporate well all this together, and plunge any red-hot iron in it.

XLVI. *To melt iron and make it ſoft.*

Take two pounds of auripigment, and four of oil of tartar. Make the auripigment ſoak up all the oil of tartar, and dry it up afterwards over a ſoft fire. Then put ſmall bits of iron in a crucible; and, when very red, throw by little at a time, about half a pound of that auripigment prepared as before; and you will find your iron ſoft and white.

XLVII. *To whiten iron like ſilver.*

Melt iron filings in a crucible, along with realgar, or red arſenic. Then take one ounce of that matter, and one of copper; melt all together, and put it in a coppel. It will give you one ounce of good ſilver.

XLVIII. *To render iron brittle, ſo as to pound like glaſs.*

Take the diſtilled water from roch alum, plunge in it ſeven different times your pieces of iron, or ſteel, beaten very thin, and made red hot every time. This operation will render them ſo brittle, that you may pound them in a mortar afterwards, as you could glaſs.

XLIX. *Ingredients which ſerve to the melting of iron.*

Iron is to be melted with any of the following ingredients; *viz.* pewter, lead, marcaſite, magneſia, auripigment, antimony, crown glaſs ſulphur, ammoniac ſalt, citrine-mirobolans, green, or freſh pomegranate rinds, *&c. &c.*

L. *To*

L. *To melt or calcinate the blade of a ſword without hurting the ſcabbard.*

You muſt drop into the ſcabbard of the ſword ſome arſenic in powder, and ſqueeze over it ſome part of the juice of a lemon. Then replace the ſword into its ſcabbard. In a quarter of an hour afterwards, or little more, you will ſee what a ſurpriſing effect this will have.

LI. *A ſpirit which will diſſolve all ſorts of ſtones.*

Take rye-flour, and make ſmall balls with it, which you will dry; then put them into a retort well luted, and place it over a gradual fire, to draw the ſpirits by diſtillation. Any ſtone whatever will diſſolve in it.

LII. *To refine pewter.*

Take fine pewter, and put it into a crucible. When melted, project over it, at different times, ſome nitre, till it comes to a perfect calcination. Repeat this three times, pounding the matter into powder, which mix with charcoal duſt. Being thus melted, it will reſume its former ſubſtance of pewter, with this difference, that it will be refined to an infinitely ſuperior degree.

LIII. *To fix mercury.*

Take verdigreaſe in powder, which put in a crucible. Make a hole in that powder, and place in it a knot of mercury previouſly impregnated with white of eggs water. Cover this knot over with borax, and add again over this ſome more verdigreaſe and pounded glaſs, one or two fingers deep. Lute well the lid of the crucible, and give a pretty ſmart fire, though gradually, and not at once, for the ſpace of two hours.

LIV. *To extract mercury from lead.*

Take lead and beat it into ſheets, or laminas, very fine. Put theſe in a glaſs veſſel with common ſalts, a double quantity of the lead. Cover this well, and bury it under ground for nine days at leaſt. After that time, if you

open the veſſel again, you will find your lead turned all into running mercury, or quickſilver, at the bottom of it.

LV. *The compoſition of caſt mirrors and cylinders.*

Take one pound and a half of red copper; eight ounces of refined pewter; one and a half of ſtellated mars-regulus, otherwiſe regulus of antimony; half an ounce of biſmuth; one and a half of nitre, and a diſcretionable quantity (that is to ſay, as much as you pleaſe) of ſilver.

LVI. *The compoſition of metallic mirrors, or looking-glaſſes, uſed among the ancients.*

1. Take one pound of decapitated, or well purified, copper, which melt; then throw over it three pounds of refined pewter. As ſoon as they ſhall be both in good fuſion, add ſix ounces of calcinated red tartar, two of arſenic, half an ounce of ſaltpetre, and two drachms of alum. Leave all this in fuſion together, for the ſpace of three or four hours, that all the ſalts may well evaporate, then caſt this compoſition in the flat ſand mould prepared for it.

2. To give theſe mirrors the requiſite poliſh, proceed as follows. Take the coarſeſt part away with the wheel over a grinding-ſtone, the ſame method as the pewterers and braziers do, and then ſmoothen them with water till they are ſufficiently poliſhed by attrition. Take the mirror from that wheel, and put it on the wooden one covered with leather, after having rubbed it well with emery, to give it a fine poliſh; then take it again from this wheel, and put it on another of the ſame kind, covered with leather, after having previouſly rubbed your mirror with prepared blood-ſtone, and waſhing it afterwards with magiſter of pewter. Take notice to make your mirrors obſerve, on both theſe laſt leathered wheels, the ſame oblique direction in turning them, and continue ſo long till the mirror has acquired a ſufficient fineneſs and brightneſs.

Convex and ardent mirrors are rubbed and poliſhed in the ſame manner.

LVII. *To make convex and ardent mirrors:*

1. Take one pound of copper in laminas. Cut them in ſmall

ſmall pieces to get them into a crucible, and impregnate them with oil of tartar. Then take a quarter of a pound of white arſenic in powder, ſtratify your laminas, putting bed upon bed till the crucible is full. Cover this crucible with a lid of the ſame earth; lute it well, and ſet it to dry. When done, plunge it to the lid in the ſand, and give it a gradual fire, till it is ſtrong enough to evaporate the oil. During that time the oil prepares the copper, in detaining the arſenic, and making it paſs into it with the ſame facility as oil paſſes through leather. You may, if you chooſe, place your crucible in the furnace on the bare fire; but then you muſt manage the fire gradually, till the oil is quite evaporated. This being done, let the crucible cool, and break it; you will find your copper variegated with ſeveral colours, and it would be ſtill more ſo, if, inſtead of arſenic, you had uſed auripigment.

2. Take of this copper one part, and two of braſs. Melt firſt the braſs on a blaſting fire; then throw in your prepared copper. When they ſhall have been in good fuſion, throw this metal into a pan full of lukewarm water, over which place a birch-room, to force your metal to granulate in falling through its twigs into the water. By ſuch precaution, your metal will be ſo hard as to reſiſt the file; will not be brittle; and acquire the ſame qualities as ſteel, inſtead of which you may employ it, for various ſorts of works.

3. Now take of this hardened metal three parts; of the beſt Cornwall pewter, and perfectly free from lead, one part. Melt firſt the metal, as we ſaid before, on a blaſting fire, then put your pewter to it; and, when both are well melted together, throw this compoſition in the convex mould, to make the convex mirrors. This compoſition is the beſt which can be employed for the manufacturing of theſe ſorts of mirrors. It is white, hard, never brittle, and ſuſceptible of receiving the higheſt and moſt finiſhed poliſh.

LVIII. *To give tools ſuch a temper as will enable them to ſaw marble.*

Make the tool red hot in the fire; and, when red cherry colour, take it off from the fire, rub it with a

piece of candle, and ſteep it immediately in good ſtrong vinegar, in which you ſhall have diluted ſome ſoot.

LIX. *To ſoften iron, and harden it afterwards more than it was before.*

1. Make a little chink lengthways in an iron bar, in which pour melted lead. Then make it evaporate by a ſtrong fire, as that for copelling. Renew this operation four or five times, and the bar will become very ſoft. You harden it afterwards in ſteeping it, when red hot, in mere forge water, and it will be of ſo good a temper, as to be fit for lancets, razors, and knives, with which you will be able to cut other iron, without its ſplitting or denting.

2. It has been found, by experience, that an armour can never be good proof againſt fire arms, if it has not firſt been ſoftened with oils, gums, wax, and other incerative things, and afterwards hardened, by ſteeping them ſeveral times over in binding waters.

LX. *The tranſmutation of iron into damaſk-ſteel.*

You muſt firſt purge it of its uſual brittleneſs; and, after having reduced it into filings, make it red hot in a crucible; ſteep it ſeveral times in oil of olives, in which you ſhall have before thrown ſeveral times melted lead. Take care to cover the veſſel in which the oil is contained, every time you throw your ſteel into it, for fear the oil ſhould catch fire.

LXI. *To guard iron againſt ruſting.*

Warm your iron till you can no more touch it without burning yourſelf. Then rub it with new and clean white wax. Put it again to the fire, till it has ſoaked in the wax. When done, rub it over with a piece of ſerge, and this iron will never ruſt.

LXII. *To cut pebbles with eaſe.*

Boil it a good while in ſome mutton ſuet; and, then, you will cut it very eaſily.

LXIII. *To*

LXIII. *To whiten copper.*

Take auripigment and egg ſhells calcinated, equal quantities. Put all together in a pot covered with another, having a little hole on the top. Give it firſt the wheel-fire for three hours. Increaſe the fire, and what ſhall have been ſublimed, remix with the *fæces* again. Sublime anew, and mix again the *fæces* and the flowers together. Then, for the third time, there will be no more ſublimation; only the flowers will ſwim over the *fæces*. Now take arſenic of one ſingle ſublimation, and crude tartar, of each equal parts, well mixed together, and ſtratify with this mixed powder ſome very thin copper laminas. Then puſh the fire with violence, to the degree of fuſion, and granulate it in water, which you are to put in great agitation for a good while, before you throw the matter into it, in order to prevent thereby your matter from ſparkling, when you throw it. In reiterating this operation on the ſame metal, you will render your copper as beautiful as ſilver.

LXIV. *A projection on copper.*

1. Take fine pewter two ounces, which you will melt in a crucible. When melted, throw in it by little at a time the ſame weight of flour of brimſtone. Stir every time with a rod, till you ſee both your pewter and ſulphur well calcinated. Then take the crucible out of the fire, and throw in half an ounce of crude mercury. Let it cool, and pulveriſe this.

2. Now melt four ounces of molten copper. When in good fuſion, project on it, by degrees, one ounce of the above powder, ſtirring carefully, while you do it, with a ſtick. Leave it thus in fuſion for a little while, and then you may uſe it for making all ſorts of plates. It is ſo beautiful, that, if you teſt it on the coppel with lead, it will ſtand it perfectly.

LXV. *The preparations of emery.*

1. Calcine eaſtern, or Spaniſh emery, three or four times in the fire; then let it cool. Pound it and make *ſtrata ſuper ſtrata* of it, with double the quantity of ſulphur-vivum in powder. Leave this crucible in the furnace

with a ſtrong fire during three or four hours. Repeat this proceſs four different times over, then reduce your emery into an impalpable powder. Put it next into a matraſs, pour over it regal water, that it ſwim over by three fingers deep. Put this in digeſtion for eight hours. Pour off by inclination your regal water, impregnated with the dye. Put new water on your matter, and ſet it on digeſting again for eight other hours, as the former. Then take your thus tinged waters, which you will mix and put in a retort. Diſtil moſt part of it, till you ſee what remains in the retort is yellow. This is the true oil of emery, in which you will put the bigneſs of a filbert of camphire.

2. Exſulphurate in a crucible, on a good fire, and during two hours, what quantity you pleaſe of arſenic. Then take two ounces of the aforeſaid oil of emery, one of your exſulphurated arſenic, an equal quantity of ſalt of tartar drawn with diſtilled vinegar, two of ſublimate, and two of ſilver; which you will have diſſolved in an *aquafortis* made with nitre and vitriol. Put all together in a matraſs, ſo large that the compoſition ſhould occupy no more than a third part of it, and of which you ſhall have cut the neck off, to obtain a more eaſy evaporation of the compounds from it. Put this matraſs in the ſand as high as the matter, and give it a moderate fire for two hours, then a ſtrong one for fix; let the fire go out of itſelf. Then you will find your matter in a ſtone in the matraſs. Take it out, and pound it into powder, projected upon another ounce of ſalt in fuſion; if you keep it a little while in that ſtate, and throw it afterwards into oil of olives, will increaſe your gold by a third of its primary quantity, and rather more: And you may thus increaſe it again and again, by repeating the ſame operation.

LXVI. *A factitious* amiant; *or way to make an incombuſtible cloth.*

Take rotten oak-wood, which you will calcine into aſhes, and mix with an equal quantity of pearl aſhes. Boil all together in ten times its weight of water. When this has boiled one hour, add as much water to it as there may have been evaporated, and boil now in it

it a large ſtick of *alumen plumoſem*, during one hour. Take off the veſſel from the fire, and carry it into the cellar. In a month's time you will find your alum as ſoft as flax. Spin it, and get it weaved into a cloth. The fire will never have any power over it. On the contrary, the beſt way to waſh it is to throw it on red-hot coals; and after having there let it burn throughout, take it off, and you will find it perfectly clean.

LXVII. *To render tartar fuſible and penetrating.*

1. Stratify cakes of white tartar with vine branches. When done, ſet them on fire by the top, and when arrived at the bottom, your tartar will be calcined.

2. Diſſolve this calcined tartar in *aquavitæ*, then paſs it through the filtering paper, and next evaporate the brandy. What ſhall remain is the ſalt of tartar, which you muſt find to be as white as ſnow. Pour over it the beſt French ſpirit of wine, ſo that it ſhould exceed over the ſalt the thickneſs of an inch. Set it on fire. As ſoon as your ſpirit of wine ſhall be all conſumed, your ſalt of tartar will be fuſible and penetrating.

3. Now ſhould you make any iron red-hot, and project on it a little of that ſalt, it will penetrate it through and through, and leave after it a veſtige as white as ſilver, in the place where it touched.

LXVIII. *To extract mercury from any metal.*

1. Diſſolve lead, antimony, or any other metal, in good common *aquafortis*. When that water ſhall have diſſolved as much of it as it can, pour it out by inclination, and on what ſhall not be quite diſſolved, but corroded only in a white powder, pour ſome hot water. Shake then the matraſs in which the metal is, and you will find that the water will finiſh to diſſolve what the *aquafortis* could not. Next paſs it through a filtering paper; and what will not paſs, diſſolve in freſh *aquafortis*. Continue thus the ſame diſſoluting proceſs, till you have obtained a perfect diſſolution of all the powder, and you have made it paſs through the filtering paper. Now take all your ſeveral diſſolutions, make a precipitation of that diſſolution to the bottom of the veſſel, in

form of white curds, by means of a water impregnated with ſalt. Edulcorate this twice, with cold common water, and once with ſome a little warm, then dry it.

2. Take one ounce of that diſſolution, thus edulcorated and exſiccated into powder; half an ounce of ammoniac ſalt ſublimed over common ſalt. Grind all together on a marble ſtone with a mullar, that it may be well incorporated, as the painters do their colours; and, to ſucceed better in that incorporation, impregnate it with diſtilled vinegar. Now put all this into a pan, and pour cold water over it, ſo that it ſhould ſwim over the matter, ſtir it well twice a day with a ſtick, for three weeks. Then take quick lime, which you will ſlack with the ſwimming liquor which covers your matter; and with equal quantities of the powder which lies under it, and the ſlacked lime, make ſmall bullets, which put into a retort well luted, and puſh it on with a great fire. You will ſoon ſee the mercury going into the receiver, which you muſt have had the precaution of filling with water, and under which, at the bottom, you will find it.

3. The ſame proceſs carefully attended to, may procure you mercury from all the metals and minerals without exception.

LXIX. *To dye in gold ſilver medals, or laminas, through and through.*

1. This curious operation is performed by means of the admirable ſalt of *Glauber*, which is made with nitre and vitriol oil, in the following manner.——Take what quantity you pleaſe of nitre ſalt, pour over it a ſufficient quantity of oil of vitriol, to ſwim over. When the ebullitions ariſing from that mixture ſhall be ended, diſtil to dryneſs; there remains a white ſalt, known under the name of ſalt of *Glauber*.

2. Diſſolve in what quantity of warm water you think proper, or be in need of, a ſufficient quantity of that ſalt as may ſaturate it, which you know, when you ſee the water can diſſolve no more of it. In this diſſolution put a drachm of calx, or magiſter of gold. Then put in digeſtion in it ſilver laminas, cut ſmall and thin, for twenty-four hours, over a very gentle fire. At the end of that

that term you will find them thoroughly dyed gold colour, inside and outside.

LXX. *To make a perpetual motion.*

Take *aquafortis*, in which throw some steel-filings, well dried. Leave this mixture to lay for six or eight hours. Then pour out the *aquafortis* in another bottle, in which you will throw a small loadstone of good quality, and stop it well that no air get in. You will observe a perpetual motion.

LXXI. *A secret fire.*

Have a barrel open by one end, and pierced with a dozen of holes on the other. Put in it three or four bushe's of oat-straw, cut very fine, as that which is given to horses. Get next half a bushel of barley, which have soaked for three days in lime water, and drained in a sheercloth of all the water which can run out of it. Place this wet barley in a lump over the oat straw, then cover it with other similar cut straw, and let it rest, when you thrust your hand in it, you feel it warm. This heat you may keep up, by throwing, with a gardener's watering-pot, about half a pint of water every other day.

LXXII. *An oil, one ounce of which will last longer than one pound of any other.*

Take fresh butter, quick lime, crude tartar, and common salt, of each equal parts, pound and mix together. Saturate it with good brandy, and distil it in a retort, over a graduated fire, after having adapted the receiver, and luted well the joints.

LXXIII. *To make a coppel with ashes.*

Take equal parts of the ashes resulting from vine branches, mutton bones, and harts horns, burnt and calcined. Moisten them with a little common water, then press them very hard in a mould called *coppel*. Then take ashes from the jaws and teeth of a jack, put over the other ashes

aſhes to the thickneſs of a crown piece, pounding well theſe alſo over the others, as hard as you can. Theſe laſt aſhes ſerve to ſet off clean the grain of the metals you are teſting on them. The harts horn aſhes ſerve to bind, or unite, thoſe of vine branches and mutton bones together, and to draw down at the ſame time the lead. You muſt uſe eight times as much lead as the compoſition you want to teſt by the *coppel* weighs.

LXXIV. *To ſolder iron, or any other metal, without fire.*

1. Take one ounce of ammoniac, and one of common ſalts; an equal quantity of calcined tartar, and as much of bell-metal, with three ounces of antimony. Pound all together and ſift it. Put this into a piece of linen, and incloſe it well all round with fuller's earth, about one inch thick. Let it dry, then put it between two crucibles, over a ſlow fire, to get heat by degrees. Puſh on the fire till the lump contained in the crucibles becomes quite red hot, and melt all together. Then let the veſſels, and the whole, cool gradually, and pound it into powder.

2. When you want to ſolder any thing, put the two pieces you want to join on a table, approaching their extremities as near as you can one to another. Make a cruſt of fuller's earth ſo, that holding to each piece, and paſſing under the joint, it ſhould be open over it on the top. Then throw ſome of your powder between and over the joint. Have again ſome borax, which put into hot wine till this is conſumed, and with a feather rub your powder at the place of the joint; you will ſee it immediately boiling. As ſoon as the boiling ſtops, the conſolidation is made. If there be any roughneſs, you muſt ſmoothen it, by rubbing with a grinding ſtone, for the file will have no power over it.

LXXV. *To ſolder with fire.*

Make a paſte with pulveriſed chalk and gum water, which put around the two broken pieces placed on a table, and prepared as before-mentioned in the preceding receipt. The only difference is, that you are to rub over the two united extremities with melted ſoap; and, after having thrown ſome of the above powder at the place of the joint, hold

hold a kindled piece of charcoal over it. This will immediately ſet the matter in fuſion, which is no ſooner done but you may take off the paſte, and you will find it conſolidated.

LXXVI. *To make borax.*

Take two ounces of roch-alum, dilute it, and mix it with two ounces of alkaline ſalt, which is uſed in making of glaſs. Put all into a pewter pot, and ſet it a-doing, for the ſpace of half an hour, over a gentle fire; then take it out of the water. Take next two ounces of gem ſalt in powder, as much of alkaline ſalt, two pounds of virgin honey, and one of cow milk. Mix well all together, and ſet it in the ſun for three days. Then the *borax* is done.

LXXVII. *To render iron as white and beautiful as ſilver.*

Take ammoniac ſalt in powder, and mix it with an equal quantity of quick lime. Put them all together into cold water, and mix well. When done, any iron piece, which you ſhall have made red hot, will, if you ſteep it in that prepared water, become as white as ſilver.

LXXVIII. *To calcine pewter, and render it as white and hard as ſilver.*

Melt well your pewter in a crucible, ſo that it may be very fine and clear. Pour it afterwards into a very ſtrong vinegar, then into mercurial water. Repeat that operation as many times as you pleaſe, you will each time give it an additional degree of hardneſs and whiteneſs, drawing near to ſilver; ſo much, that it will at laſt be very difficult to diſtinguiſh it from ſilver itſelf.

LXXIX. *Another to the ſame purpoſe.*

Make a good lye with vine branch aſhes and vinegar. Throw in your pewter when in fuſion. Repeat this, ſeven different times.———Have next ſome new goat's milk, in which you ſhall have added ſome white arſenic in powder. Melt your pewter again; then throw it in this preparation. Repeat twelve times the ſame, and the pewter will become as hard and as white as ſilver.

LXXX. *To*

LXXX. *To whiten braſs.*

1. Take roſin and ſaltpetre, equal quantities. Pound all in a mortar, and reduce it into an impalpable powder. Put this into an earthen pan made red hot, and thus burn the matter. As ſoon as done, you muſt waſh and dry it, then grind it again as before, with the addition of an equal quantity of auripigment. Then put all this into a crucible, cover it with another well luted, and having a little hole in the top, which you will ſtop by laying only a medal on it. When calcined, take what you will find clear in the bottom, not what will have ſublimed on the top. Make a very fine powder of this matter; and, with *one* ſingle ounce of that powder, you will be able to whiten two pounds of braſs, in proceeding about it as follows.

2. Melt firſt your braſs as uſual; and, when in good fuſion, caſt it into very good vinegar; an operation which you muſt repeat three times. Then, when you melt it for the fourth time, you are to project on it, as we ſaid before, *one* ounce only (if you have two pounds of braſs) of the ſaid powder, which will render your braſs as white as ſilver.——*N. B.* To melt the braſs with more facility, throw in the crucible a certain diſcretionable quantity of mice-dung.

LXXXI. *Another method.*

Braſs, copper, iron or ſteel, may alſo be eaſily whitened by means of the butter from Cornwall tin, or pewter, prepared with ſublimate, proceeding as follows.

Take Cornwall pewter, about one pound; add to it half that quantity of ſublimate. Set it on a ſtrong fire, and ſublime. Throw away the firſt water. The ſecond is good, which you know by its white colour. Now, if you make a piece of copper, braſs, ſteel, or iron, it does not ſignify which, red hot, and ſteep it in that water, it will become as white as ſilver.

LXXXII. *To extract gold from ſilver.*

1. Melt whatever quantity you pleaſe of lead, in a crucible, over a fire of clear and bright live-coals. Have at the ſame time in fuſion an equal quantity of ſulphur. Then

Then take your firſt crucible, in which the lead is melted, off from the fire; and, before the lead ſhall congeal, throw in the ſame quantity in weight of quickſilver. Stir and mix well this with a ſtick. When this is done, pour your ſulphur, from the other crucible, over the mixture of lead and quickſilver you have juſt made, and which coagulates, continually ſtirring carefully the matter with a ſpatula, for fear the ſulphur ſhould blaze and be conſumed, before it is all poured in. When the whole is come quite cold, grind it on a marble table with a mullar. Then put all again into a crucible over the fire, and leave it in fuſion till all the ſulphur is burnt out, and the matter be fluid enough to be caſt in an ingot. This will look like the regulus of melted antimony. It will have even its brittleneſs.

2. Reduce this compoſition into powder, and, with an equal quantity in weight of it and of ſilver laminas, make *ſtrata ſuper ſtrata* of them, alternately, in a crucible, beginning and ending always with the powder. Then, over the laſt bed, put about half an inch thick of Venetian glaſs, or cryſtal, reduced into an impalpable powder. Obſerve however that the crucible ſhould not be filled ſo near the brim as to let the glaſs boil over. Make a fire ſtrong enough to melt both the matters and the glaſs, and ſet them thus in fuſion all together for an hour at leaſt. Then take off, and let cool, your regulus; in breaking your crucible, make a coppel, or teſt, in which you will put lead in fuſion, till it is as fluid as it can be. Throw in your regulus to purify it by that teſt, in the ſame manner as ſilverſmiths do.——When your ſilver ſhall be fallen to the bottom very pure, put it in laminas, or granulate it; then put it to diſſolve in *aquafortis*. You will ſee ſome ſmall particles of fine gold precipitating from it, in the form of black powder. Waſh theſe in warm water; then put them in fuſion, in a crucible, and you will have true pieces of good gold, fit for any of the chymical phyſics, and capable to ſtand any teſt.

CHAP.

CHAP. III.

Secrets for the Compoſition of Varnishes, &c.

I. *A gold varniſh.*

TAKE *karabe*, or amber, eight ounces, and two of gum-lac. Melt firſt the karabe, in a varniſhed earthen pot, or in the retort of an alembic, over a very ſtrong fire. When this is melted, throw in the gum-lac, and let this melt in the ſame manner. Then take ſome of the fire off, and let it cool; obſerving with a ſtick, whether the matter has got all its fluidity. Mix in it ſix or eight ounces of turpentine oil. Keep ſtirring, in order to incorporate well this oil with the reſt. Add alſo a ſpoonful of lintſeed oil, prepared with *hepatica*-aloes, which, in order to reduce to the thickneſs of a ſyrup, mix with a ſufficient quantity of oil of turpentine, tinged with *rocou*.

II. *How to prepare the lintſeed oil with the* hepatica-*aloes, for the above purpoſe.*

Prepare the lintſeed oil with *hepatica*-aloes, by mixing four ounces of this in powder, with one pound of the ſaid oil, over the fire, till it has acquired the conſiſtence of a very thick ſyrup, and you ſee your oil beginning to ſcum, and to ſwell much. Then paſs it through a piece of linen, let it cool, and bottle it, to keep for the above-mentioned uſe.

III. *To draw the tincture of* rocou *uſed in the compoſition of the above varniſh.*

In order to draw the tincture of *rocou*, put four ounces of

of it in oil of turpentine. Set this over a gentle fire, in the retort of an alembic; and, as ſoon as the oil begins to boil, take it off from the fire; ſtir well with a ſtick, and filter it through a paper, to uſe it as directed before.

IV. *A varniſh for iceing.*

Concoct ſome turpentine with water, and white wine, or brandy. When concocted, diſſolve it in wine and oil of turpentine.

V. *An excellent varniſh.*

Take what quantity you pleaſe of verdigreaſe, grind it with vinegar, put in a piece of dough, as you would an apple to make a dumpling. Bake it in an oven as bread; then cut open your dumpling, and get the verdigreaſe out of it. Mix it with wine, and uſe it. Lay over it a coat of four ounces of gum arabic; then poliſh as uſual. You will find it will anſwer your expectation, and be a very fine varniſh.

VI. *For colouring and preſerving gates, poles, barns, &c.*

Melt twelve ounces of roſin into an iron pot, or kettle; add three gallons of train oil, and three or four rolls of brimſtone. When the roſin and brimſtone are melted and become thin, add as much Spaniſh brown, or red or yellow oker (or any other colour you want, ground fine, as uſual with oil) as will give the whole as deep a ſhade as you like. Then lay it on a bruſh as hot and as thin as you can. Some days after the firſt coat is dried, give it a ſecond. It is well atteſted, that this will preſerve plank for ages.

VII. *A red varniſh.*

1. Take three ounces of gum-lac; half an ounce of ſandarak; as much of maſtich in drop, and a pint of French ſpirit of wine. Put all in a matraſs, which you muſt take care to lute well with potter's clay, and ſtop with paper. Have a large iron kettle, two parts of which ſhall be filled with ſand. Place the kettle over the coals, and lay the matraſs on the ſand. Get the compoſition to boil

boil in that ſituation for three hours. Strain it through a ſheercloth; bottle and ſtop it well, and keep it for uſe.

2. To make this varniſh red, you put one ounce of vermilion to ſix of the ſaid varniſh. But to dilute the vermilion, you muſt begin by pouring, firſt, ſome oil of aſpic over it, and then the ſix ounces of varniſh, which will take near a quarter of an hour to mix well together.

3. Obſerve that the wood on which you want to lay it, has been firſt well poliſhed. Rub it again beſides with a pounce ſtone and vinegar, that all the pores may be well filled, and ſhould appear no more. Then lay with a bruſh, firſt a coat of ſimple varniſh, without vermilion. Let this dry; put on next your ſecond coat, of that which is prepared with the vermilion; then a third and a fourth, according as you want it of a more or leſs deep red.

VIII. *A black varniſh.*

1. Take gum-lac, four ounces; ſandarak and black roſin, equal quantities, one ounce of each. Pulveriſe all ſeparately, and keep them diſtinct, to proceed afterwards in their mixture according to the following directions. Diſſolve the roſin over the fire in a ſufficient quantity of ſpirit of wine; then add the ſandarak to it. As ſoon as this is alſo diſſolved, add the powder of gum-lac, and ſtir well till all is melted together. Strain it, while warm, through a cloth. If any thing remain in the linen afterwards, add ſome more ſpirit of wine, to diſſolve it as before; and ſtrain it again.

2. The black colour is given to it by means of *two drachms* only of ivory black to every *two ounces*.

IX. *To make ivory-black for the above purpoſe.*

Burn any quantity of ivory you pleaſe, in the fire, till it is black. Put it into powder on a ſtone of porphyry. Add ſome water to it, and make a paſte, which you let dry. Then grind it again, as before, with ſpirit of wine.

X. *A varniſh for floors.*

Put a little petroly or rock oil with varniſh and turpentine, and ſtir well. Lay it on your floors with an old hair

hair broom, after having mixed in it the colour you want them to be.

XI. *A varnish from Flanders.*

Take æthereal oil of turpentine, and Venice turpentine, equal parts. Mix them over a moderate fire, and use this boiling.

XII. *A varnish to lay on canvass pashes.*

Take fine and clear turpentine, four ounces; oil of nuts, two. Melt all together over a fire; and when it begins to boil, scum it, and use it hot with a brush.

XIII. *A varnish of shell-lac, for pictures.*

1. Take spirit of wine, one pound; pickled shell-lac, five ounces; sandarak, two and a half; white karabe and mastick, equal parts, two drachms of each.

2. First boil and skim the shell-lac and sandarak together, to have them the whiter. Then add the mastick and karabe to that, and put all in a matrass over a sand fire, to digest and concoct together by a gentle heat.

XIV. *Another varnish for pictures.*

Take four ounces of gum arabic, the clearest and whitest you can find. Put it to infuse in a pound of water, over ember ashes, for one night. Strain it in the morning through a cloth, after having added to it the bulk of a nut of Narbonne-honey, and half that quantity of sugar candy. It is not to be used with a brush.

XV. *Another sort.*

Take *aquavitæ*, sugar-candy, and whites of eggs, a reasonable quantity of each. Beat all well together to a froth. Underneath is a liquor; that is your varnish. You may lay it with a soft brush on any sort of picture.

XVI. *The Chinese varnish.*

1. Take pulverised and sifted sealing wax, two ounces. Put it in a matrass, with four ounces of turpentine oil. Give

Give a gentle fire, that all may melt. If the wax be red, you need add nothing but the oil. If black, ſome lamp-black is requiſite to be added ſtill. And, with this firſt compoſition, you lay on the firſt coat.

2. Next to this have aloes and karabe, of each two ounces. Diſſolve this in a varniſhed pipkin, along with twelve ounces of lintſeed oil, till all is well incorporated. There will fall a ground to the bottom, over which will ſwim a very fine and tranſparent liquor. Of this you are to make your ſecond coat of varniſh, laying it over the other after it is dry.

XVII. *To imitate jaſper, or variegated black marble.*

Take *ſulphur-vivum*, quick lime, *aquafortis*, and the green rind of walnuts, one ounce of each. Dilute all together; then lay it with a bruſh on what you want to be jaſpered, whether a column, a table, or any thing elſe. This done, put your table or column, &c. thus blackened, in a dunghill, for the ſpace of twelve days, and then take it out again. You will find it well veined and variegated. To give it a fine gloſs, rub it with a varniſh compoſed as preſcribed hereafter. *See* Art. xix.

XVIII. *Another way.*

Make a large ball, with the drugs preſcribed in the above receipt, to compoſe your black. Lay it for a week in a dunghill. When by that means it is well variegated, rub your intended piece of furniture with it.

XIX. *An excellent varniſh to give a fine gloſs to jaſper, or variegated black marble.*

Take oil of ſpikenard, three ounces; ſandarak, well picked and clean, two. Have a new earthen pot well glazed. Set it before the fire a warming, without any thing in it. When hot, throw in it one half of the ſandarak, and one half of the oil. Stir well, leſt it ſhould burn, or ſtick to the pot. When it is nearly melted, throw in the remainder of the oil and ſandarak. When all is well diſſolved and mixed, add a piece of camphire, to take away the bad ſmell of this compoſition, and let it diſſolve;

diſſolve; then bottle and ſtop it for uſe. It requires to be uſed hot.

XX. *A varniſh which dries in two hours time.*

Melt four ounces of yellow amber, in a new earthen pan, over kindled coals. Take care, in that operation, that the fire ſhould but juſt reach, and touch, the bottom of the pan, and none ſhould riſe along the ſides. Never ceaſe to ſtir, from the moment it is melted, with a deal ſtick, and add directly one ounce of ſealing-wax. As ſoon as this is alſo melted, add half an ounce of lintſeed oil, previouſly thickened with a little gold litharge; then take it off from the fire, and ſtir it as before. When the matter begins to be a little cold, then is the time of adding what quantity of turpentine oil you find neceſſary.

XXI. *A varniſh for copperplate prints.*

Prepare water with ſome iſinglaſs. Lay, with a very ſoft bruſh, a coat of this on the print. Next to this, lay another of the following varniſh—True French ſpirit of wine, half-a-pound; gum-elemi, two drachms; and ſandarak, three.

XXII. *An admirable varniſh.*

Take white maſtick and lintſeed oil, what quantity you pleaſe; a little turpentine, pounded glaſs, burnt verdigreaſe, and pounded amber. Boil and melt all together in a new earthen pot. When done, you will find it to be an admirable varniſh.

XXIII. *A varniſh fit to lay on all ſorts of colours.*

Take one ounce of white amber; half an ounce of ſpirit of turpentine; four ounces of rectified ſpirit of wine (the true French ſort); one drachm of maſtick, and as much of juniper gum. Put all together to infuſe for eight days. Evaporate two parts of it over a gentle fire. What remains is a varniſh fit for laying on all ſorts of colours, and which will hurt, ſpoil, or damage none.

XXIV. *A*

XXIV. *A varniſh known under the appellation of* Beaume-blanc, *or white balm.*

Take ſpirit of wine, four ounces; gum-lac, half an ounce; ſandarak, two drachms; maſtick, one. Pulveriſe the ingredients, and put them, with the ſpirit of wine, in a ſquare bottle, large enough to be but half full after the whole is in it. Diſſolve this over a ſlow fire, and take care the bottle be well ſtopped.

XXV. *A varniſh to be uſed on plaiſter, and any ſort of materials.*

To the varniſh of copal and ſpirit of wine, only add ſome calcined talk.

XXVI. *An excellent varniſh, in which may be put, and diluted, whatever colour you like.—It ſuits, equally well, goldſmiths and limners.*

Take aſpic and turpentine oils, of each one ounce; clean picked ſandarak pulveriſed, four drachms; gum copal, two. The whole being well pulveriſed, put it along with your oils in a matraſs, with the addition of half a pound of ſpirit of wine; and ſet it in a *balneo mariæ*. When the matter is diſſolved, ſtrain and keep it for uſe, in a glaſs bottle well ſtopped.

XXVII. *A Chineſe varniſh ſuitable to all the ſorts of colours.*

1. Take one ounce of white amber; one quarter of an ounce of ſandarak; as much of gum copal. Pound theſe together, and put them in a matraſs perfectly dry. To every ounce pounded and mixed thus together, put three ounces of ſpirit of wine. Stop well the matraſs with a rag, ſome paſte made with flour, and then another rag, well tied over. Boil the varniſh thus, over ember aſhes, till the whole is diſſolved: apply it as follows.

2. The piece intended for varniſhing being previouſly well poliſhed, you lay on it the propoſed colour or colours, diluted in *aqua vitæ*, with ſome iſinglaſs. When theſe are dry, paſs on them two or three coats, according to diſcretion; allowing proper time between each coat of varniſh

varnish to dry; and when dry, polish it with olive oil and tripoly, then rub the oil with a rag.

Note. If you intend this varnish for miniature pictures, you are to make an addition of equal parts of gum copal and white amber.

XXVIII. *Chinese varnish, particularly calculated for miniature painting.*

Take one ounce of white *karabe*, or amber; and one drachm of camphire, reduced into a subtile powder, and put in a matrass, with five ounces of spirit of wine. Set it in the sun to infuse, during the hottest days, stir it two or three times a-day. After a fortnight's infusing thus, put the matrass, for one hour, over hot ashes; then pass all through a cloth, and keep it in a bottle well corked.

XXIX. *How to make a red, with varnish, of a much higher hue than coral itself.*

Take Spanish vermilion, grind it on a marble with brandy, and add to it the sixth or eighth part of lac. When done, mix this composition with as much varnish as you may find it requisite to apply.

XXX. *To make it gridelin colour.*

Dilute with your varnish some blue verditure, lake, and whitening.

XXXI. *To make it green.*

Substitute for the above ingredients German green verditure, pewter in grain, and white lead.

XXXII. *Another way for the same.*

Grind, with water, on a marble stone, the finest orpine you can find, and a little indigo. Let it dry, then pound and mix it with varnish.

XXXIII. *To make it yellow.*

Take some Naples yellow, and mix it well with your varnish; then use it.

XXXIV. *To make it blue.*

Take ultramarine, lake, and whitening, and proceed as ordered in the other receipts abovementioned.

XXXV. *Another ſort of varniſh.*

Take ſhell-lac, in grains, two ounces; two of ſandarak; black roſin, two drachms; and ſpirit of wine, one quarter. Diſſolve and prepare the whole as above.

XXXVI. *A tranſparent varniſh fit for all ſorts of colours.*

Take oil of nuts, and a little of the fineſt Venice turpentine. Boil them together. Add a little brandy to it, and boil it alſo. Should the varniſh prove too thick, thin it with an additional quantity of oil. Make uſe of a very ſoft bruſh, and lay it carefully over the colours.

XXXVII. *To make ſaſhes with cloth which will be very tranſparent.*

Take fine white cloth; the finer, the more tranſparent the ſaſhes will be. Fix the cloth very tight on a frame. Then make ſome ſtarch with flour of rice, and lay a coat of it, as ſmooth as you can, on both ſides your cloth, with a ſtiff bruſh; let it dry. Then the following varniſh, with a ſoft bruſh, having care to lay it on as equally as poſſible.

XXXVIII. *The varniſh fit for the above ſaſhes.*

1. Take of the fineſt and whiteſt wax you can find, ſix pounds; of the fineſt and cleareſt Venice turpentine, two; one and a half of the moſt perfect lintſeed oil. Have a new and varniſhed pipkin, larger, at leaſt by one third, than is requiſite to contain all theſe ingredients. Put, firſt, in this pot, the lintſeed and turpentine oils together, and ſet it over a ſmall charcoal fire.

When this begins to be a little warm, put in the wax, cut in ſmall bits, and take care to mix all well with a clean ſtick, till the wax is thoroughly incorporated with the reſt.

2. Now, take the pot off from the fire; and, while this compoſition is ſtill a little warm, give a coat of it on both

both sides, prepared as before directed, and let it dry in the shade.

Note. You may render your sashes still more transparent, if, on both sides of them, you lay a smooth coat of the following varnish, with a soft brush:

XXXIX. *A fine white varnish.*

Take one pound of fine Venice turpentine, and as much of spirit of turpentine. Put this in a glass matrass, larger, at least by a third, than is wanted to contain the matter. Stop this matrass with another smaller matrass, the neck of which is to enter into that of the former. Have care to lute well both necks together, with paste and paper; and, when the luting has acquired a perfect dryness, set the first matrass on a sand bath, then set the varnish a-boiling, for near an hour, after which, take it off from the fire, and let it cool. When cold, bottle and stop it for use.

Note. Turpentine, well purified from all its greasy parts, is the best, and fittest to make the varnish for sashes.

XL. *A varnish to prevent the rays of the sun from passing through the panes of window-glasses.*

Pound gum adragant into powder, and put it to dissolve, for twenty-four hours, in whites of eggs, well beaten. Lay a coat of this on the panes of your windows, with a soft brush, and let it dry.

XLI. *To raise a relief on varnish.*

1. Dissolve one ounce and a half of gum arabic in two pounds of water. Grind with it bol armeniac and whitening, on a porphyry stone, till all is well united and incorporated. With this composition, fill up the vacancies between the outlines of your design, and form, as it is proper, the various reliefs, with the suitable proportions, and according to the sorts of things you are to imitate or represent. Then smooth the parts, and let it dry.

2. Next have ready prepared, in shells, the different sorts of metals which you want to use, diluted with gum-water; and, with a pencil, cover what places you are to

cover. When this is alſo dry, burniſh it ſkilfully with an ivory tooth, and lay a coat of clear varniſh over the whole. A moderate heat is required for a moment, to help that varniſh to dry.

XLII. *To render ſilk ſtuffs tranſparent, after the Chineſe manner; and paint them with tranſparent colours likewiſe, in imitation of the India manufactured ſilks.*

Take two pounds of oil of turpentine, very clear; add to it two ounces of maſtich in grain, and the bulk of a filbert of camphire. Let this diſſolve by a gentle heat; then ſtrain it through a cloth. Of this oil lay one coat, or two, on both ſides of your ſtuff. Allow, however, a ſufficient time between each coat, for each to dry, and let the ſecond lie two days on, before you touch the ſtuff again. When that time is over, draw the outlines of your deſign, and flowers, &c. cover this with a preparation of lamp-black and gum-water. Then fill the intervals with the intended and proper colours, ſuitable to the purpoſe, and which ought to be all tranſparent colours, diluted with a clear varniſh. When this is done, and dry, lay on both the right and wrong ſides of the ſtuff another coat of clear varniſh.

XLIII. *To make a tranſparent blue hue, for the above purpoſe.*

Take nine drachms of ammoniac ſalt; ſix of verdigreaſe, diſtilled and exſiccated. Put both theſe into powder. Dilute theſe powders with tortoiſe oil. Put this on a very thick glaſs, which ſtop well, and ſet over hot aſhes for a week. After that time your colour will be fit for uſe, and make your drawings with the clear varniſh, as directed in the preceding article.

XLIV. *To make a tranſparent yellow hue, for the ſame uſe.*

Take a new-laid egg of that very day, make a hole in the ſhell, to draw the white out of it. Replace, by the ſame hole, with the yolk, two drachms of quickſilver, and as much of ammoniac ſalt; then ſtop the hole with wax. Set that egg in hot dung, or over a lamp fire, for four

four or five and twenty days. When that time is over, break the egg, and you will find a very fine tranſparent yellow, fit for the uſe abovementioned.

XLV. *To make a tranſparent green.*

Take verdigreaſe, gold litharge, and quickſilver, equal parts. Grind the whole in a mortar, with the urine of a child. Put it next into a bottle, and ſet it over a gentle and ſlow fire, for the ſpace of ſeven or eight days. This compoſition will give a very fine tranſparent green, for the above purpoſe.

Note. We have given, in the Sixth Chapter, ſeveral receipts for the compoſition of ſundry tranſparent colours. We ſhall therefore take the liberty thither to refer the reader, for more ample ſatisfaction, and the completion of the abovementioned operation.

XLVI. *To give the abovementioned painted ſilks all the ſmell and fragrancy of the India ones.*

It is well known, that the ſilks, and other things, we receive from India, are all tainted with a certain particular ſmell, and agreeable fragrancy, which being their peculiar, diſtinctive, and moſt obvious character, if not imitated alſo, would help not a little in ruining the deception intended by the above labour. To imitate therefore, even this, you muſt obſerve the following direction. —Have a ſmall cloſet, if it be for works at large; or, only a fine baſket with a top to it, playing upon hinges, ſtuffed and lined all over in the inſide, if it be for one ſingle piece of ſilk. Put in either of them, and according to their extent, a proportionable quantity of cloves, whole pepper, mace, nutmeg, all-ſpice, camphire, &c. &c. Put your works among thoſe ingredients, and keep either the cloſet, or the baſket, perfectly cloſe ſhut, till you ſee they have received a full impreſſion from the odour of thoſe ingredients.

N. B. With the various compoſitions of varniſhes, and preparations of colours, we have juſt given, there is almoſt no ſort of works, coming from the Indies, but can be performed and imitated.

XLVII. *The true receipt of the Engliſh varniſh, ſuch as is laid on ſticks and artificial made canes.*

Smoothen and poliſh well your ſticks; then rub them, or your artificial made canes, with a paſte made of flour. Then, having diluted, in water, a diſcretionable quantity of Flemiſh glue, and red orpine, give one coat of this, very ſmooth and equal, to your ſticks. If, after this is dry, you do not think it ſufficient, give them another, and let them dry. Then, give them a third coat, of clear varniſh, made with turpentine and ſpirit of wine. After this is done, put a-ſoaking, in an equal quantity of water and chamber-lye, ſome turnſol, cut very ſmall. With this colour you touch your ſticks, or canes, here and there, with a hair bruſh. Then holding them perpendicular, on their ſmall ends, between both your hands, you roll them quick and briſk (as when you mill chocolate) in contrary ſenſes. This operation gives them a negligent and natural-like marbling, over which you are to lay another coat of varniſh, and ſet them to dry.

XLVIII. *A fine varniſh for all ſorts of colours.*

1. Take two pounds of double rectified ſpirit of wine; ſeed-lac, four ounces; ſandarak, as much; gum copal, one. Set all a diſſo'ving, on hot aſhes, in a matraſs, or a veſſel with a long neck. When perfectly diſſolved, ſtrain it through a jelly-bag, made of new cloth. Mix, with that which ſhall have ſtrained out of the bag, one ſpoonful of oil of turpentine; then bottle and ſtop it well, and ſet it in the ſun. There will happen a ſeparation, and a certain coarſer part will ſhew itſelf at the bottom, while another more clear will appear ſwimming on the top. Divide carefully, by inclination, the cleareſt from the thickeſt part.

2. This laſt you may uſe with fine lamp-black, well picked, and free from all ſorts of hard knobs, to make a black-colour varniſh. With it you rub whatever you want to be varniſhed, and lay one, two, or three coats of it, more or leſs, according as you think proper, letting dry between each coat. And, when this is done, you put,

of

of the firſt ſeparated clear part of your varniſh, as much as you find requiſite to give your work a fine luſtre.

N. B. It is proper there ſhould be ſome fire, ſo near to the work, as it may receive from it ſome gentle heat, while all this is performing; and when the whole is well executed, you muſt let dry in the ſhade what is varniſhed, and guard it againſt the duſt.

3. If, inſtead of black, you want a red colour, you muſt, from the very beginning of the operation, join ſome tacamahaca-gum with the ſpirit of wine of double rectification abovementioned; and, in lieu of lamp-black, in the ſecond part of the operation, you put ſome cinnabar in powder. Then, when you have done with laying the ſeveral coats of varniſh, in which the cinnabar is, you put in the clear varniſh, which is deſtined to make the laſt coats, for luſtring, ſome dragon's blood in tears.

4. You may put, in the ſame manner, whitening in your varniſh, if you want it white; or verdigreaſe, if you want it green; and ſo on any other colour you want it to be, proceeding, in reſpect to each of them, as before directed for the others.

N. B. Theſe varniſhes, when dry, do all require to be poliſhed. For that purpoſe, take a cloth, dip it in tripoly, and rub, with moderation, over the laſt coat of varniſh, till you find it has acquired a ſufficient degree of luſtre and equality.

XLIX. *A varniſh to lay on, after the iſinglaſs.*

Take ſpirit of wine, four pounds; white amber, fourteen ounces; maſtich, one; ſandarak, ſeven. Put all in digeſtion, for twenty-four hours. Then, ſet the matraſs on the ſand, and give the fire for three hours, till all is perfectly diſſolved. Add after, four ounces of turpentine oil.

L. *A varniſh to gild with, without gold.*

Take half a pint of ſpirit of wine, in which diſſolve one drachm of ſaffron, and half a drachm of dragon's blood, both previouſly well pulveriſed together. Add this to a certain quantity of ſhell-lac varniſh, and ſet it on the fire, with two drachms of *ſoccotrine*-aloes.

LI. *A varnish water proof.*

1. Take lintseed oil, the purest you can find, put it in a well glazed pipkin, over red-hot charcoals, in a chafing-dish. With that oil add, while a-warming, about the fourth part of its weight of rosin. Make all dissolve together, and boil gently, lest it should run over the pot. At first, the oil will turn all into a scum; but, continuing to let it boil, that scum will insensibly waste itself, and disappear at last. Keep up the fire till taking a little of that oil, with a stick, you see it draw to a thread, like as varnish does. Then, take it off from the fire. But if, trying it thus, it prove too thin, add some more rosin to it, and continue to boil it.

2. When it is come as it ought to be, varnish whatever you want with it, and set it in the sun to dry, or before the fire, for it cannot dry without the assistance of either of these.

N. B. This composition of varnish has this particular property, viz. that, if you lay it on wooden wares, hot water itself cannot hurt it, nor have the least power on it. You may, therefore, make a very extensive use of it. But you must take care to choose the finest and the most perfect rosin, and to boil it well, for a long time. Quære, *Would not such a varnish be extremely useful, to preserve what is much exposed to the injuries of the weather, in gardens and elsewhere; such as sashes, statues, frames, hot-houses, &c.?*

LII. Callot's *varnish, mentioned in Chap.* I. *p.* 2.

1. Take two ounces of the finest lintseed oil; benjamin, in drops, two drachms; virgin wax, the bulk of a filbert. Boil all this together, till it is reduced to one third; and, while it is a boiling, never cease to stir with a little stick. When done, bottle, or put it in a large mouthed vessel.

2. To use that varnish, warm a little the plate you intend to engrave upon; and, taking a little of the varnish with the tip of your finger, spread it delicately over the plate. Observe to put as little of it as you can, and to lay it on as smooth and equal as possible. When done, smoak the plate, on the varnished side, with a candle, passing and

and repaſſing it gently, over the flame of it, till it is black every where. Set it again, now, on the chafing-diſh, wherein there are kindled charcoals; and, when the plate has done fuming, then the varniſh is ſufficiently hardened. You may then chalk, draw, and etch, whatever you will on it.

Such is the true receipt of the varniſh, which the famous *Callot* made uſe of, to engrave his moſt admired and truly admirable ſubjects.

LIII. *A varniſh to lay on paper.*

Begin by laying on your paper one firſt coat of very clear and thin ſize. This being dry, melt three parts of oil of ſpike and one of roſin together; and, when come to the conſiſtence of a varniſh, you lay one ſecond and light coat of this over the firſt made with ſize. This varniſh is very fine, when very ſmoothly and equally laid on.

LIV. *Another varniſh.*

Take maſtich and ſandarak, equal parts, of each two ounces. Pound them into a fine powder. Have three ounces of lintſeed-oil, and as much of ſpirit of wine, in which, being mixed, you put your powders. Set this, in a well ſtopped matraſs, in a *balneo mariæ*, to boil and concoct together for one hour; and this varniſh is done.

LV. *L'Abbe* Mulot's *varniſh.*

Take of ſpike oil, one ounce; pulveriſed ſandarak, half an ounce. Put all in a bottle, and ſet it in the ſun till perfectly diſſolved. This compoſition is particularly fit to varniſh gold or ſilver, in ſhell, which has been laid on with a hair pencil.

LVI. *A varniſh to lay over plaiſter works, or figures.*

Take fine white Alicante ſoap, raſp it fine, and put it in a glazed pipkin. Diſſolve that ſoap, in the pipkin, with your finger and a little water, added gradually, and little at a time, till it comes thick and milky. Cover this, for fear duſt ſhould come to it, and let it reſt ſo for ſeven or eight days. Take, next, a ſoft and ſhort hairy bruſh,

dip it in this ſoapy preparation, and waſh the plaiſter figure all over with it, then ſet it a drying. When dry, rub it gently with a piece of cloth, placing yourſelf between it and the light, that you may perceive better the places which take the poliſh; when done thus every where, your ſtatue will appear as white, ſhiny, and beautiful, as alabaſter.

LVII. *A very fine red varniſh.*

1. Take oil of ſpike, one pound; and litharge as much. Boil both together, for one quarter of an hour, in order to clarify the oil, or, what is called, ungreaſing it. When thus clarified, take one pound of it, and ſix ounces of ſhell-lac, which melt together in a matraſs, or a varniſhed pipkin. Then, dilute it in ſome cinnabar, which had previouſly been grinded on a ſtone, with chamber-lye; and the varniſh is done.

2. Of this compoſition, lay firſt three or four coats on your work, and allow time ſufficient, between each coat, to dry. When the laſt is given, lay on another of pure and clear varniſh, without cinnabar, made with one part of ſpirit of wine, and four of oil of ſpike, and ſome ſhell-lac.

LVIII. *A varniſh to gild certain parts of ſtamped leathers, ſilvered in ſome places with pewter leaves, and otherwiſe adorned with running ſtalks of flowers, various colours, figures, and other ſorts of embelliſhments.*

1. Take linſeed oil, three pounds; of that ſort of varniſh called *Arabian ſandarak*, and rough pitch, equal quantities, one pound each; and ſaffron, half an ounce. Inſtead of ſaffron, you had better, if you have that opportunity, make uſe of the ſtaminas of lilies, which are infinitely preferable. Put all into a varniſhed pipkin, and ſet it over the fire. Take great care not to have it burn; and, to avoid it, keep continually ſtirring the matter with a ſpatula. When you want to know whether it be or not ſufficiently done, have a hen's feather, juſt dip it in, and off quickly. If the feather be grizzled, it is a proof the matter has ſufficiently boiled. Therefore, take it off from

from the fire, and throw in one pound of well choſen and picked hepatica aloes, in powder. Mix well this with the ſpatula, and ſet it again on the fire, to concoct well this addition with the reſt. If you ſee that your matter boils and ſwells, you muſt take it off, and let it reſt awhile; during which time, take ſome of the coals away. Set it now again upon this more moderate fire, ſtirring always well, that all may be perfectly incorporated. As ſoon as this is done, take it off, let it cool a little, and ſtrain it through a ſtrong coarſe cloth, and keep it for the following uſe.

2. Apply the ſilver, or pewter leaves, on the leather, with the white of an egg, or gum-water. When theſe are properly laid on, give one coat of the above varniſh, quite warm, on ſuch places as you want to appear gilt, and ſet it in the ſun. When dry, it looks like gold.

N. B. The *Arabian ſandarak*, we have preſcribed above, is known by ſome, under the denomination of *Gum of Juniper*.

LIX. *To imitate porphyry.*

Take Engliſh brown red; if too red, add a little umber to it, or ſome ſoot. Pound all into powder. Then have a marble ſtone, of a fine poliſh, which overlay with oil. Make a colour compoſed of brown red, and a little flat, or Venetian, lake, previouſly grinded with gum adragant. Then, with a largiſh bruſh, take of that colour, and aſperſe your oiled marble with it, by ſtriking the handle of the bruſh on your wriſt (as bookbinders ſtain the covers of their books). When your marble ſhall have been thus well ſpeckled all over with that red colour, you let it dry. Then, taking your lump of brown red and umber, dilute it, make a thin paſte of it, and lay it on your ſpeckled marble. When this is alſo dry, it admits of a very fine poliſh, and looks like porphyry.

LX. *To imitate ſerpentine.*

1. Take auripigment, grind well firſt with water, and next with a little addition of indigo. Let this dry; then reduce it to an impalpable powder; then mix it with a

little gum adragant, and make a paſte of it, as in the above receipt.

2. After this is done, take ſome lighter green, put a little more auripigment with the indigo, till you come to obtain the true hue of the ſpots which are in the *ſerpentine*. Of this colour you take with a bruſh, and aſperſe with it a marble piece, in the ſame manner exactly as deſcribed in the preceding article; and when this is dry, lay your firſt prepared paſte on it. For the reſt, do as above.

N. B. You may thus, with a bruſh, imitate, or even invent, all ſorts of marbles, according to your taſte and fancy; and, when the firſt laid colours are dry, lay your paſte over them, let them dry likewiſe, and poliſh. For example, have ſeveral different colours prepared as above; aſperſe, or mark with each of them ſeparately, and one after another, on ſome piece of glaſs, or well poliſhed marble. Then make a paſte, and lay it over them, of whatever colour you will. If you will have it white, it is done with whitening, and a little mixture of yellow ochre. Theſe ſorts of works admit of being overlaid with an exſiccative varniſh.

CHAP.

CHAP. IV.

Secrets relative to Mastichs, Cements, Sealing-Wax, &c. &c.

I. *A ſubtile maſtich to mend all ſorts of broken veſſels.*

TAKE whites of eggs, and beat them well to a froth. Add to this ſoft curd cheeſe, and quick-lime, and begin beating a-new all together. This may be uſed in mending whatever you will, even glaſſes, and will ſtand both fire and water.

II. *Another.*

Take roſin, yellow wax, ſulphur, and cement. Sift this laſt very fine, and melt all together; then uſe it.

III. *A maſtich to make rock works.*

Take ſix parts of Paris-plaiſter, and one of ſoot, well mixed together.

IV. *An excellent maſtich.*

Take coarſe turpentine, four ounces; fricaſſeed and pulveriſed bullock's blood, one ounce; black pitch, four; wax, two; roſin, one; pounded glaſs, one; cement, one; and ſulphur, half a one. Boil all together, after having well pounded and grinded each of them ſeparately.

V. *A maſtich for broken wares.*

Pound a ſtone jar into an impalpable powder, and add to it ſome whites of eggs and quick-lime.

VI. *Another*

VI. *Another maſtich.*

Take quick-lime, cotton and oil, of each equal parts in weight.

VII. *Another.*

Take frankincenſe and maſtich, of each half an ounce; bol armeniac and quick-lime, of each two ounces.

VIII. *A cement.*

Take roſin, one ounce; grinded tile, half an ounce; maſtich, four ounces.

IX. *A glue to lay upon gold.*

Boil an eel's ſkin, and a little quick-lime together; when boiled gently for the ſpace of half an hour, ſtrain it, and add ſome whites of eggs beaten; bottle, and keep it for uſe.—The method to uſe it afterwards, is to warm it and lay a coat of it on marble, delph, Worceſter, Staffordſhire, or any other earthen wares, &c. and when nearly dry, write, paint, or draw what you pleaſe on it with a pencil, and gold in ſhell.

X. *A ſize.*

Take half a pound of freſh cod's tripes, boil it in two quarts of white wine, reduced to one third. To take off the bad ſmell, add, while it boils, a little cloves and cinnamon. Then throw this ſize in whatever mould you pleaſe, to make it in flakes.

XI. *An exceeding good ſize, called* Orleans ſize.

Take the whiteſt iſinglaſs you can find; ſoak it in finely filtered quick lime water, during twenty-four hours. When that time is over, take it off bit by bit, and boil it in common water.

XII. *A cement for delph, and other earthen wares.*

Take what quantity you will of wax and roſin. Melt them together, and add while in fuſion, a diſcretionable quantity of marble pounded into a very fine powder.

XIII. *Another*

XIII. *Another for the same purpose, which resists water.*

Take quick-lime, turpentine, and soft curd cheese. Mix these well together; and, with the point of a knife, put of this on the edges of the broken pieces of your ware, then join them together.

XIV. *A cold cement for cisterns and fountains.*

Take litharge and boil in powder, of each two pounds; yellow ochre and rosin, of each four ounces; mutton suet, five ounces; mastich and turpentine, of each two ounces; oil of nuts, a sufficient quantity to render malleable. Work these all together; and then it is fit for use.

XV. *A lute to join broken vessels.*

Dissolve gum arabic in chamber lye over a chafingdish; stir with a stick till perfectly dissolved, then add an equal weight of flour, as you had of gum arabic, and concoct the whole for one quarter of an hour, or more, if requisite.

XVI. *A strong glue with soft cheese.*

1. Take a cheese from Auvergne. Let it be the fattest and newest you can find, neither dry nor moist; wash it in very warm water, so long as it should remain clear; then set it to rot in clean water, till it begins to stink. As soon as you find it is so, boil it in water, with quick-lime; and when dissolved into a glue, take it off from the fire, it is done.

2. If you dry some whites of eggs in the sun, and that, pounding them into powder, you should add some of that powder with the cheese when you dissolve it along with the lime, the glue will be so much the stronger.

N. B. Observe that no other cheese, besides that which comes from Auvergne, has the quality requisite for this composition.

XVII. *To make a strong mastich.*

Take one pound of rosin, a quarter of a pound of shoemakers rosin, two ounces of new wax, two of black pitch, and one of tallow. Boil all gently together on a slow fire;

fire; and when well incorporated together, add ſome brickduſt, finely ſifted according to diſcretion.

N. B. The quantity of tallow is to be proportioned to the degree of dryneſs you require in this compoſition; ſo that you may, on that principle, diſcretionally increaſe or diminiſh the preſcribed doſe of that ingredient.

XVIII. *To make corks for bottles.*

Take wax, hog's lard, and turpentine, equal quantities, or thereabouts. Melt all together, and ſtop your bottles with it.

XIX. *To imitate rock works.*

Take white wax and roſin, equal parts; and brimſtone, a quarter part of both the other two put together. Melt the whole at the ſame time, and throw it in cold water. It will form itſelf like the ſcum of the ſea. When you want to apply it, warm only that part by which you deſign to ſtick it.

XX. *To rub floors with, whether boards, bricks, &c.*

Take a pailful of ſcarlet waſh from the dyers, with this ſtuff rub your floor by means of an old hair broom. Let it dry, and obſerve not to tread upon it till it is perfectly dry, then have from the plumber ſome black lead, which is generally of a black or reddiſh hue, ſqueeze well all the knobs you may meet with between your fingers, and rub your floor all over with it, with your hands, then with a rough dry bruſh, ſcrub well your floor, till it comes fine and ſhiny.

XXI. *A compoſition to make a relief fit to gild over, or even to raiſe an embroidery.*

1. Take one pound of lintſeed oil; ſandarak, maſtich, Burgundy pitch, aſſafœtida, new wax, and turpentine, equal quantities, four ounces of each.

2. Pound all, and put it in a varniſhed new pipkin, to boil for two hours, over a ſlow fire. Then keep it in the ſame pot, to make your paſte as you want it.

3. This

3. This paſte is made as follows. Take ceruſe and umber reduced into a ſubtile powder, which dilute with the above compoſition, in ſufficient quantity, to make a ſort of dough, obſerving never to make more of it at a time than you think to employ directly, for when dry it becomes as hard as marble.

4. The method of uſing it is to draw on whatever you will, whether cloth, linen, ſilk, thread, plaiſter, &c. the outlines of what you want to have raiſed in relief, as arms, trophies, figures, fruits, flowers, &c. according to your deſign, or fancy. Then fill up thoſe ſketches, and raiſe them with the above paſte, while it is ſoft; and when it begins to dry, you gild, ſilver, or paint it over as you like.

5. You may paint alſo the ground of thoſe reliefs with whatever colours you pleaſe, and enrich it with gold ſpangles, if you chuſe. The way to do it, is by laying firſt a coat of varniſh of iſinglaſs and roſin melted together.

N. B. There is a work of this kind to be ſeen at Vienna, on the great altar of the Virgin Mary.

XXII. *Sealing wax.* Recipe 1ſt.

Take one pound of ſhell-lac; benjamin and black roſin, half an ounce each; vermilion, eight drachms. The whole being melted, make your ſticks on a marble table, rubbed over with oil of ſweet almonds; and take care to have done before the wax is cold.

XXIII. *Another ſealing wax.* Recipe 2d.

Take turpentine and ſailor's pitch, ſix drachms of each; either ſhell-lac or dragon's blood, one; ſulphur citrinum, two. Mix and incorporate all together over the fire, and form your ſticks.

XXIV. *Another.* Recipe 3d.

Take gum *hæderacea*, ſhell-lac, ſandarak of the ancients, otherwiſe printer's roſin, and maſtich, two ounces of each; roſin, four ounces; turpentine, half an ounce. Mix all in a very warm bell-metal mortar, and make your ſticks.

XXV. *Another.*

XXV. *Another.* Recipe 4th.

Take ſhell-lac and maſtich, of each one ounce; dragon's blood, three; cinnabar, half an ounce; turpentine, one. Mix all, and make your ſticks.

XXVI. *Another.* Recipe 5th.

Take Greek pitch, one pound; white maſtich, five; frankincenſe, five ounces; cinnabar, as much as you ſee it requiſite to give the red colour.—Put the pitch firſt on the fire to melt; next put the maſtich, and the powder of frankincenſe; and laſt of all, the cinnabar grinded with a little oil. Incorporate all well, and take it off from the fire, to make your ſticks.

XXVII. *Another.* Recipe 6th.

Take ſhell-lac, twelve ounces; maſtich and roſin, of each, one ounce; dragon's blood, three; minium, half an ounce. Diſſolve the ſhell lac in vinegar; add if you will, ſome turpentine oil and ſulphur, to the quantity of four ounces of each, and two of ammoniac ſalt. The whole being melted, make as faſt as you can your ſticks of the form and ſize you like.

XXVIII. *Another.* Recipe 7th. *Exceſſively good.*

1. Take ſhell-lac, &c. &c. pound them all into a very fine and impalpable powder. Then have two wooden pallets preſent upon them, before the fire ſome powder of one ſort to melt, then move it and ſtir it with the ſaid pallets. Take again of another powder in the ſame manner, and mix it in the ſame way before the fire with the firſt. Then another, and another, till they are all, by this method, perfectly well amalgamated together.

2. Have now ſome cinnabar in powder, which put in a pan with water. In that water and cinnabar powder, ſet to infuſe, or only touch your incorporated gums, to make the compoſition take colour. When thus ſufficiently coloured, take it out of the water with both your hands and the wooden pallets, and have a perſon to help

help you. This, having wetted his hand, will draw ſome of the ſaid gum, and handling it on a table, will form the ſticks.—For two pounds of gums, two ounces of cinnabar are wanted.

XXIX. *Another.* Recipe 8th.

Take gum-lac, four ounces; cinnabar, half an ounce; roſin, four and a half. Melt the roſin with a little vinegar, and ſkim it. Then take it out of the fire; then mix it with the lac and vermilion both well pulveriſed; and, when the compoſition begins to cool, form your ſticks with it.

XXX. *An excellent ſealing wax, by* Girardot. Recipe 9th.

Put four ounces of roſin, and four and a half of whitening, and melt them together, in a non-varniſhed pipkin, over kindled coals. While this is in fuſion, have another pot, ſimilar to this, in which you keep two ounces of ſhell-lac, in diſſolution with vinegar. Now ſteep a wooden ſtick in the firſt pot, and another in the other pot; then, over a chafingdiſh, turn quickly, one over another, the ends of your two ſticks together, to mix and incorporate well what matter they ſhall have brought along with them from each pipkin. And after having turned them thus a reaſonable time, you ſee both matters are well embodified, ſteep them, at different times, in the following liquor, to colour them.

XXXI. *A colour for the above wax.*

Grind, upon a porphyry table, two ounces of cinnabar, with a ſufficient quantity of nut-oil, to make it a liquid. In this you dip your ſticks, at ſeveral times; and take care, in doing it, the compoſition ſhould not grow cold. Wherefore you muſt, each time you ſteep them in the colour, carry them again over the chafingdiſh, to keep them in a due ſtate of malleability. And when you find the matter ſufficiently tinged with red, form your ſticks as uſual, on a marble, or other well poliſhed table.

CHAP.

CHAP. V.

SECRETS of GLASS MANUFACTORY, and the making Compositions to imitate PRECIOUS STONES, commonly called FRENCH PASTE.

I. *The general composition of the paste to make spurious precious stones, such as emeralds, sapphires, rubies, &c.*

1. PUT three ounces of Poitiers burnt lead in a sufficient quantity of water to have this rise about three fingers above the other. Beat next both together in a bottle, and let it settle. Draw, by inclination, this water, as soon as the lead is separated from it, in some other vessel. It will serve you to wet the inside of the glazed earthen pot in which you are to put your ingredients, and prevent their sticking to it.

2. Dry, now, three ounces of minium, and mix it with the aforesaid burnt lead, one ounce of calcined crystal, and one scruple of copper filings. All these being previously well pulverised, and mixed, put them in a glazed pipkin, which have hardened, and wetted afterwards insidely with the abovementioned lead-water. Cover it; then put it in the furnace of a glass-maker, three or four days, or in a wind furnace, for one day only. At the end of that time you shall find you have got a very fine white paste, which you may cut as you like.

3. To make this paste yellow, you are to substitute iron filings, for the copper ones; and to make it to imitate rubies, substitute cinnabar.

II. *To make emeralds, and other precious stones.*

1. Dissolve some alkaline salt in common water, and filter

filter it through a hat; then recover your salt by means of evaporation. Dissolve it again, filter and evaporate as before, and repeat this operation three times. Then, pulverise this salt after the third evaporation, and put it by. Dissolve one ounce of verdigrease in vinegar, and strain it; then, put it by likewise. Have, next, fine crystal, which grind and sift very fine, in an apothecary's sieve, and after the same manner as they do the prepared crystal.

2. To that ounce of the said verdigrease, put two and a half of the crystal powder, and two only of the pulverised alkaline salt.

3. These three powders put in a small glazed pipkin, and lute it so that no air can get in to the contained ingredients. Let it dry for three days or more, then put it in a potter's kiln for twenty four hours. After that time you will find in the pot, a matter perfectly similar to the diamonds in beauty, and which you may cut, and work, in the same manner.—This composition is susceptible of all sorts of colours, and of being made, of course, to imitate all sorts of stones, in varying accordingly one of the drugs in the following manner.

4. For example. If you want to make a ruby, instead of the abovementioned verdigrease, which makes an emerald, put some cinnabar. For sapphires, put *lapis lazuli*; and for hyacinths, coral; all which are to be prepared, and used, like the verdigrease, for which they are substituted.

5. The finest paste for the making artificial stones is to be composed with crystals, pebbles, or Bohemian topazes. For, if you make your composition with glass and lead only, the stones will be deficient in weight and hardness.

6. The pebbles and the abovementioned topazes are calcined just the same way as crystal. You have only to mix afterwards with these powders what colour you please. Minium and verdigrease give the emerald colour. Ceruse and saffron of Mars, that of hyacinth. Minium and ceruse make a chrysolite. With the *zaphera*, or *lapis lazuli*, or again, with ammoniac salt and silver, you obtain a sapphire. They who know how to extract the gold

gold sulphur from that precious metal, declare, that they can by means of this solitary and incombustible sulphur, give the crystal the most beautiful colour of rubies.

III. *To calcine calcedony-stone and crystal, in order to compose precious stones with them.*

1. Dissolve calcined tartar in about half a pint of water, then strain it into a bason. Now, in an iron spoon with a long handle, make red-hot your crystal, or calcedony-stone; and when red-hot, throw them in the said tartar-water. If you take them out, redden and extinguish them again six or seven times in the same manner, they will be perfectly well calcined. After having reduced them into an impalpable powder, you may use that powder, in due proportion, in whatever mixture you will, to give them a colour according to what you want to make. If for emeralds, for example, the composition prescribed in the above article will do very well.

2. Observe, however, that if you intend to make emeralds, the pulverisation of your calcined crystals must be made in a brass mortar; while if you intend to make rubies, you must use an iron mortar, and have a great care not to pound the crystals in a brass one.

IV. *To make emeralds.*

With two ounces of crystal duly prepared as before directed, join one of borax; eight grains of tin-glass calx, and twenty of magnesia. Mix all well together in a brass, or bell-metal mortar, and put it in a crucible; cover it with its lid, and lute it well. When the lute is perfectly dry, place the crucible two hours in a potter's fire; then take it out and let the composition cool. Break the crucible, and you will find an excessively fine composition to make emeralds.

N. B. Tin-glass calx is nothing else but a dissolution of tin-glass in *aquafortis*, tempered afterwards with common filtered water.—Observe also, that you must not neglect stirring and mixing well the calx and magnesia together, before you incorporate it with the crystal.

V. *For*

V. *For topazes.*

Two ounces of cryſtal; one of borax; eight grains of tincture of Mars. Mix all well in an iron mortar, then proceed as before directed for emeralds.

VI. *For ſapphires.*

Cryſtal, two ounces; borax, one; ultramarine, eight grains; and magneſia, twelve. Mix well, then proceed as above.

VII. *For amethyſts.*

With two ounces of cryſtal, one of borax, and twelve of magneſia, you mix ten grains of ultramarine; then go on as above.

VIII. *For hyacinths.*

Take two ounces of cryſtal; one of borax; four or five grains of ſaffron of Mars, and as much of magneſia, then proceed as above.

IX. *For rubies.*

Dutch red jaſper, ſix drachms; pulveriſed cryſtal, two; minium, twenty-four grains. Reduce the whole into a ſubtile powder, and keep it ſeven hours at moſt in the potter's-fire, as above directed.

X. *Another way to make emeralds.*

Take one pound of pebbles, calcined and prepared as before directed; ſalt of tartar, ten ounces; ſaffron of Mars, five times as much as you can hold on a Spaniſh real; and the fifth part of this whole quantity of braſs finely pulveriſed.—When all is well mixed in a mortar, and put in a crucible duly luted, &c. put it in the fire for ſix days; and having taken it out, ſee whether the compoſition is fine or not. If too deep in colour, add a little pebble and ſalt of tartar properly prepared; if too clear, add ſome crocus or ſaffron of Mars, and braſs, to raiſe it in colour.

XI. *Another*

XI. *Another compoſition for hyacinths.*

To your prepared cryſtal, add ten pounds of ſalt of tartar, about one ſpoonful of white wine tartar, and a little bran.

XII. *Another for rubies.*

Prepare one pound of pebbles, or cryſtal, and add to it a quarter of an ounce of dragon's blood, mix all well, and put in a crucible.

Obſerve, that if you ſet this compoſition longer than two days in fuſion, it loſes its colour. As ſoon, therefore, as you ſee it has acquired a fine degree, take off the crucible, and let it cool.

XIII. *To make diamonds.*

Mix, with a ſilver ſpoon, ſix parts of fine white calcined pebbles, reduced into an impalpable powder, with four of the whiteſt and beſt pulveriſed tartar, and ſeven of alkaline ſalt.

Put this in a crucible, made of the ſame earth as is uſed in glaſs manufactories, and put in their fire. The longer it remains there, the harder and finer the compoſition will be. It muſt be there ſeven months at leaſt, before it can acquire a tolerable fine luſtre.

Note. That the powders we have mentioned to make the above compoſitions with, are all to be ſifted through a very fine ſieve, before they are uſed.

XIV. *A water to harden artificial ſtones.*

Prepare and calcine, as before directed for cryſtal, ſome ſmall bits of calaminary ſtone. Pulveriſe them, and then place that powder in a very damp cellar, till reduced into water. With this water knead ſome Roman, Dutch, or Hungarian vitriol, quite crude, without reddening it in the fire. When this paſte, which is to be ſoft, is made, put it in a retort, and diſtil what water will come from it. With this other water, and ſome barley flour, make another paſte quite hard. In this

paſte

paſte put your lump of compoſition, or even the ſtones themſelves, which are come from it, ready cut and poliſhed, when they come out of the wheel, and make as a dumpling of the whole. Send it to the oven to be put in, and taken out, along with the bread. When your paſte comes back from the oven, open it, and you will find your ſtones as hard as natural ones.

If they ſhould not prove ſo hard as you wiſh them, repeat this operation once more, and they will then moſt certainly be as hard as true diamonds.

XV. *A dye, to put under diamonds, both true and falſe, when they are ſet.*

Gather the ſmoke of a candle in a cup, dilute it with maſtich oil, make a thick mixture of it. Put ſome of this under your ſtone, whether fine or not, when you ſet it.

XVI. *To make white ſapphires, to imitate true diamonds.*

1. Jewellers generally take a white ſapphire, and put it on the fire in a crucible, in which they bury it under ſteel filings.

2. Some go ſtill farther, and chooſe gold filings; fancifully thinking, that as this metal is far more precious than the other, it is likewiſe infinitely better for the operation, and of courſe to be preferred. But, deceived in their conjectures, as they muſt unavoidably be, who have no other guide to direct their judgment, experience has ſince ſhewn, that maugre the inferiority of ſteel to gold, yet the former metal's filings are, for the following purpoſe, greatly ſuperior to thoſe of the latter.

3. Bury your ſapphire in a crucible, under ſteel filings. Set it on the fire, and let the filings become ſo hot as to be nearly melting, but you muſt take care they do not melt. Let your ſapphire lay thus under theſe filings, a little while. Then take them off, and pick out your ſapphire, to examine it. If its whiteneſs does not pleaſe

you yet, ſet in on the filings again, and renew this operation not only once, but as many times as you will find neceſſary to make it acquire that beautiful degree which you want your ſapphire to have. Then ſet and colour them as was ſaid before.

XVII. *A better way of doing the ſame.*

Mix together equal quantities of white enamel, finely pulveriſed, and ſteel filings. Have next a little of the ſame pulveriſed enamel, without mixture of filings, make a kind of paſte with your ſpittle. Put your white ſapphire in this paſte, with which wrap it up well, and ſet it to dry in the oven. Tie this ball all round with, and at one of the ends of, a very fine wire. Then bury this ball in a crucible, under the firſt mixture of ſteel filings and enamel powder, and put it on the fire, which puſh to the degree of *nearly* fuſing the enamel, taking care, however, it ſhall not poſitively happen. Then, with one end of the wire, pull out the ſapphire from the crucible, and ſee whether its whiteneſs pleaſe you; if not, begin again the ſame way as before, and repeat this operation, till you obtain the deſired point.

XVIII. *A colour to make rubies.*

1. Melt in a crucible one ounce of mars regulus. Throw in it a ſimilar quantity of copper, and as much of gold. Let the whole be in fuſion till reduced to one ounce only. Add another ounce of mars regulus, and one of copper, and proceed as before. Repeat this operation ſeven times over.

2. Now take the lump which you find at the bottom of the crucible, and which ought to be as red as rubies; throw it in four ounces of granulated ſilver in fuſion, and previouſly amalgamated with ſixteen ounces of purified and animated mercury. Having thus put on this mixture, the gold prepared as we ſaid, put all in digeſtion for fifteen days, over ember aſhes only, for fear the mercury ſhould ſublimate. After that time is over, ſeparate the mercury by diſtillation, and teſt the reſt on the coppel.

3. This

3. This compoſition, projected on ſuch cryſtals as are in fuſion in the glaſs-maker's pot, will give you the moſt beautiful ruby paſte which you can poſſibly imagine or wiſh for.

XIX. *To whiten amethyſts.*

Let a glaſs bottle be almoſt filled with five or ſix ounces of purified nitre. In the nitre bury your amethyſts. Then let this bottle itſelf be entirely buried alſo in a great iron pot, filled with ſand, ſo that the air cannot poſſibly come at it, and give it a fire capable only to put the nitre in fuſion, but not to make it red-hot, elſe all will be ruined. Let this remain in that fuſible ſtate five or ſix days. Then let the ſand cool itſelf gradually. When quite cold, take the bottle out of the ſand, break it, and you will find the amethyſts of a fine white; and as they are cold, you may without any difficulty, throw them in water, to get the nitre away from about them. Should any of them prove not quite ſo white, you may ſave them for another time, to make them undergo the ſame operation along with ſome others. Suppoſe your glaſs bottle ſhould unluckily come to break, and the nitre ſhould run off, then you muſt abſolutely take it out; for the amethyſts, without nitre, would certainly be hurt by the fire.

XX. *To make emeralds light and hard.*

1. Calcine, ſix different times, rock-cryſtal, and plunge it, as many times, in cold water. Pound it on a ſtone of the ſame mineral, with the mullar of the like kind, and paſs this powder through a fine ſilk ſieve.

2. To two ounces of this powder join ten grains of ſcories of copper, well cleanſed, and three times calcined. Pound and mix well theſe two ingredients in a braſs mortar. Add four ounces of the beſt and fineſt borax, previouſly well pounded in powder by itſelf. Incorporate all together. Put this in a crucible, covered with its lid, and well luted. Place it, after the lute is perfectly dry, in a reverberating fire, for ſeven or eight hours, and let the fire be very clear. At the end of that time, ſtop the

aſh-hole, and all the openings of the furnace. Let this compoſition perfectly cool, for fear it ſhould bubble, or otherwiſe blow. Then break the crucible, and you will find a beautiful emerald paſte, which may be given to the lapidary to cut.

XXI. *To give cryſtal a perfect hardneſs.*

Diſſolve what quantity you like of urine ſalt in clear water. Filter and evaporate to dryneſs. Then make alternate *ſtrata ſuper ſtrata* of this ſalt, and powder cryſtal in a very ſtrong crucible, which ſet for eight days in a glaſs-maker's furnace. After that time, being cooled gradually, you may take it out, and get the compoſition cut, which will prove exceſſively hard.

XXII. *A cement to render cryſtal like diamonds, and give the ſapphires of Alenſon a hardneſs to cut glaſs with eaſe.*

Make a ſtrong dough with ſifted barley-flour and petroly (or rock-oil). Divide this paſte in two equal parts. In one of them range your ſtones, ſo that they ſhould not touch one another. With the other part of your paſte cover this. Wrap up the whole with a good lute, and give it a wheel fire for four or five hours, gradually increaſing the ſtrength of the fire between every two hours. Then you will have a lump of ſtones, which will ſparkle like true diamonds.

XXIII. *To make cryſtal throw off as much fire as diamonds.*

Take loadſtone and new quick-lime, equal parts, two pounds of each; ſulphur vivum, half a pound. Put all in powder, and ſtratify according to art, in a crucible, your cryſtal, ready cut, with this powder. Place this crucible in a glaſs-maker's furnace, for ſeventy-four hours, you will find your ſtones very fine, ſparkling, and perfectly like the diamonds of the ancient rock.

XXIV. *Another way of making diamonds.*

Grind on marble, equal quantities in weight, of calcined ſilver, and French loadſtone. Stratify in a crucible, your cryſtal ſtones, ready cut in imitation of diamonds, with

with this powder. Cover it with another crucible, and lute it well. Then set it in a glass-maker's furnace, for one month.

XXV. *To give the white amethyst the colour of a true diamond.*

Wrap some amethysts in a paste of pure white enamel, prepared as directed in Art. xvi. Place them in a crucible, which cover with a tile, and put in a glass-maker's furnace, for forty-eight hours. Let it be red-hot all that time. Then take it off from the fire, and let cool. When these amethysts shall have been new polished, they will look like, and be judged for, true diamonds.

XXVI. *To imitate calcedony.*

Put, in a crucible, in a glass-maker's fire, some very fine crystal powder. When in fusion, add a little calcined silver to it; mix it well, and set it in fusion for twenty-four hours, then let cool. When you take off your matter, you will find it imitates perfectly well calcedony, part of it being bright, and the other a little more dull.

XXVII. *To make a crysolite.*

Project, on crystal, melted in a strong crucible, six times its quantity of iron scories. Keep this thus in an ardent furnace for the space of three days. Then let all cool. When you take that composition from the crucible, you will find it answer your expectation.

XXVIII. *To make diamonds with* jargons.

Put in a crucible equal quantities, well mixed, of iron filings, pounded and finely sifted, and powder of white wood coals. In this mixture, plunge and bury your *jargons*, and let none appear above. Give, first, a small fire to the crucible, and increase it gradually, till the *jargons* become red hot. Keep them in that state for a length of time; then let the fire go off gradually,

in the same manner in which you had increased it before. When cold, take out your *jargons*, which you will find have lost their first colour. To give them the true water peculiar to fine diamonds, take the powder of coals as before mentioned, and an equal quantity of minium. Put your *jargons* in the centre of that powder, in a crucible as before, observing to increase the heat and diminish it, just as in the preceding operation. When all is cold, you will find your *jargons* as fine and beautiful as true and natural diamonds.

XXIX. *To make* Doublets *in rubies and emeralds, as they do at* Milan.

1. Fix on the point of a knife a large piece of mastich. Heat it before the fire; there will immediately run a drop as white as pearl. This is called mastich in drops.

2. Now if you want to make an emerald, you must dye this drop of mastich with a little verdigrease diluted in oil, and a little addition of wax, if required. If it prove too thick, add a little water.

3. If it be for a ruby, take equal quantities of gum-arabic, *alumen saccarinum*, and crude roch-alum; boil all in common water; then add to it a little brazil wood, cut very thin and small, and let it boil again. You may add some *alumen catinum*, if you choose, which will darken your colour in proportion to the quantity you put in; then plunge the drop of mastich above mentioned in that liquor, and thus give it the red dye.

4. Have now two pieces of crystal ready cut by the wheel. Let them be both of the most perfect flat surface, and of the most exquisite fineness and precision in dimensions of their sides, when laid one over another, with this only exception, that the crystal intended to be the upper one, should be a little thinner than that which is intended to be laid under. Put each of these pieces on an iron plate over red-hot cinders, and set them thus till the crystal becomes very hot. Then with the above red-dyed drop of mastich which you hold at the end of a stick, and have a little softened before the fire, you rub gently the upper surface of the piece of crystal, intended

to

to be the under one, till you see it has acquired a sufficient degree of redness, according to your liking. Then take with small pincers the other piece of crystal, quite hot, lay it on the former, and they will both stick to each other, without occasioning the least obscurity in the lustre of the rubies, which will be equally clear and transparent on both sides.

5. In the same manner proceed to make the emerald. Therefore, when either of these two operations is accomplished, your stone is ready to be set with a red tinsel under it, if a ruby; or a green one, if an emerald.

XXX. *To soften crystal.*

Redden it in the fire, and when full of fire, plunge it in mutton and lamb's blood, mixed and warmed together. Reiterate this two or three times, and it will be soft.

XXXI. *Another to soften crystal, or any other coloured stone, so that you may cut it like cheese; and restore it afterwards to its primary hardness.*

1. Take, in the month of August, goose's and goat's blood. Let each of them dry, till very hard. When you want to soften your stones, take an equal quantity of each blood, pulverise it and put in a pot, then pour over a strong lye made of pearl ashes. Leave it so for a while, stirring often; then add about a pint of strong vinegar. In this preparation, if you set your stones, and warm it a little over the fire, they will become so soft, that you may take and cut, or form them afterwards as you will.

2. To restore them again to their former hardness, put them in cold water, and let them there lay for about one hour and a quarter, it will be quite sufficient.

3. But to give them their lustre again, you must take antimony in powder, spread it on a very smooth leaden table, then polish your stones on this. It will restore them to their brightness as before.

XXXII. *Another equally useful to soften crystal and steel.*

Make a strong lye of quick lime and pearl ashes. Run it nine or ten times more over new lime and new pearl ashes, each time. Then put to soak, in this preparation, any piece of crystal or steel, for the space of twenty-four hours, and you will see what a surprising degree of softness they will have acquired by it.

XXXIII. *A paste, which will procure as beautiful emeralds as natural ones.*

Calcine, fix different times, rock crystal, and plunge it, as many times, in pure cold water. Grind it into powder, on a rock crystal stone, with a mullar of the same. When you have rendered the powder very fine and impalpable, to one pound of it, add another of salt of tartar, drawn from red tartar, mixed well. Join to this, sixty grains of red copper, and fifteen of silver, both in shell, but grinded separately. Now mix the last powders with the former, on a marble stone, and put all together in a clean and double nealed crucible. Lute it well with its lid, and, when the lute is perfectly dry, put the crucible for six days on a clear, but gentle fire; then increase the fire till the crucible becomes red hot, place it immediately in the ardent and glass melting furnace, and keep it there in the same degree of heat for a month, without interruption. Then let the crucible cool gradually in the furnace, which is done by letting the fire go out of itself, having previously stopped all the holes and openings of the furnace. When you break it, you will find a beautiful green, which is fit to cut by the lapidary.

Note. Be careful of this composition, for it has all the merit and advantage of the true *emerald*. It vies with it in weight, colour, and hardness. In short, the greatest connoisseurs cannot distinguish these emeralds from the finest real ones.

XXXIV. *Another way of making emeralds.*

1. Take two large transparent river pebbles, or rock crystal

cryſtal pebbles. Calcine and ſift ſix grains of copper, and two drachms ſix grains of ſalt of tartar, pulveriſed, and in the following manner.

2. Calcine the tartar to whiteneſs; throw it in water, and warm it to ebullition. But before it boils, it will throw a ſcum, which muſt be carefully ſkimmed off, as it is a prejudicial unctuoſity. When all the ſcum is well off, evaporate the water, till what is on the fire becomes into a conſiſtence like honey. Now add as much cold water as there was before. Heat it again to ebullition; and, before it boils, ſkim well again the new unctuoſity which it will throw out, then boil to the conſiſtence of honey. Repeat this operation eight or ten different times running, adding always new water each time, which you ſtill ſkim, boil and evaporate each time, as preſcribed for the firſt. At the tenth time, let the water you put in be firſt filtered once or twice through a paper, then vaporiſe the water entirely, and you will have a very fine and pure ſalt of tartar. By theſe means you purge the tartar of all its unctuoſity, which would make the emerald ſcale and flaw on the lapidary's wheel while it is cutting.

3. Take this matter, pound and grind it with a braſs peſtle and mortar. Sift it in a very fine ſilk ſieve. Pound a-new what ſhall not have paſſed through the ſieve, and ſift it again, and ſo on till you have reduced all into an impalpable powder. Put it in a crucible, as in the above articles, and place it in a melting glaſs furnace for twenty-four hours, and your matter will be done and ready for uſe.

XXXV. *To whiten imperfect diamonds.*

Make red hot, and calcine in the fire, a loadſtone, and plunge it in the ſtrongeſt vinegar, which you repeat eight or ten times. Then, with barley flour, pulveriſed verdigreaſe, and this vinegar, make a ſtrong paſte, in which you wrap up your diamonds. Dry firſt this paſte by a gentle fire; then give it a ſmart one for four hours.

XXXVI. *To counterfeit diamonds.*

1. Melt by means of fire, ſome tranſparent pebbles.

Grind them next into a very fine powder, then ſet this powder again a-melting on the fire. Put your ſtones afterwards in a paſte of barley flour, and bake under aſhes, the diamonds will be done.

2. To give them a proper water, nothing elſe is to be done, but put them in *aqua vitæ*, which having ſet fire to, let burn out entirely. By that operation they acquire the right colour of diamonds.

XXXVII. *Various dyes for precious ſtones.*

1. Dragon's blood in drops, pounded and ſifted in alcohol, then diſſolved in ſpirit of wine of ſix rectifications, will give you the colour for the rubies.

2. That of the topaz is made with gamboge, diſſolved in the ſame ſpirit of wine as before, and put in a matraſs, to evaporate to conſiſtence of honey; then it is fit for uſe.

3. For emeralds, fixed green verditure diſſolved, and vaporiſed as above, will give this dye.

4. The ſame mode of proceeding, in reſpect to imitation of other ſtones, will give you the colour you may want for that purpoſe, if you take care to chooſe and draw, *ſecundem artem*, the dye from each of the colours fit for that object, and then apply it to your paſte or compoſition in the following manner.

5. When the dye you intend to uſe is ready, have a crucible, bore a little hole at the bottom of it. Turn its bottom upward. Set your cut cryſtal on that hole. Make a gradual wheel fire round it. While your crucible heats, make ſome ſmall common pebbles red hot in the fire, and throw them in your liquor to give it a certain degree of heat, and prevent the calcination of your cryſtal. And, when this is ſufficiently hot, plunge it in your dye.

XXXVIII. *A colour for glaſſes and enamels.*

Take Roman vitriol calcined to whiteneſs in the ſun, three times wetted with brandy, and three times dried. Now calcine it in the fire to redneſs, and puſh the fire for

for three days to the higheſt degree. Then, at the bottom of the retort you will find a ſulphur of a dry roſe colour, very dark, and deprived of all ſaline particles. You may uſe it after the method preſcribed in the preceding article, for giving any glaſs, or enamel, a fine colour of rubies.

XXXIX. *Another ruby colour.*

Melt in a crucible one ounce of cryſtal, and throw on it the ſame quantity in weight of oil of mars, otherwiſe, oil of antimony, with two grains of virgin gold. Whatever remains fixed in the crucible is the enamel.

XL. *Another, the invention of* Sainte Marie, *the enameller.*

File and put in a matraſs a gold ducat, with two ounces of *aquafortis*, and one of ammoniac ſalt, to diſſolve the gold. To facilitate the diſſolution, place the matraſs on ember aſhes. Then take two pounds of ſilver ſand, one of ſalt, one of arſenic, and ſix of ſaltpetre. Pulveriſe each ſeparately, and being afterwards mixed and put in a crucible, pour over it the diſſolution of gold, which is in the matraſs. This crucible being put in a melting glaſs furnace for twelve hours, will give the fineſt red for rubies which can be found out.

Note. *Sainte Marie* ſold it at three half crowns a pound; though for one crown he could make two pounds.

XLI. *A compoſition, the fundamental baſis of all enamels.*

1. Grind on marble, and ſift through a very fine ſieve, equal quantities of lead and pewter-calx. Put it in a varniſhed pipkin filled over with water. Boil it ſome while; then pour it by inclination, in another veſſel. Put new water, to boil again over the calx, and decant it as before, on the firſt water: which proceſs you repeat till you have entirely diſſolved all the calx. If ſome part of the metal remain at the bottom, too groſs to be entirely carried by the waters, it muſt be put in a melting-glaſs furnace to calcine, having care to take out, in proportion

as it turns into calx, the upper part of the matter. When it is all calcined, continue diſſolving it, by means of boiling water, as you did the firſt. When you have got all your waters of diſſolution, vaporiſe them over a ſlow fire; and particularly towards the end of the evaporation, have a ſingular care that the fire be not too fierce, which then remains at the bottom, very fine and ſubtilized.

2. To twenty-five pounds of this calx add an equal weight of frit, made of tarce, or white ſand, well pounded and ſifted through a very fine ſieve, and four ounces of white ſalt of tartar, pounded and ſifted in the ſame manner. Put theſe ingredients in a melting glaſs furnace; melt and purge them there for ten hours. Then, having taken the pot off from the fire, take out the matter, which, after having well pulveriſed, keep in a cloſe dry place, where duſt cannot come at it.—Such is the firſt and principal matter to be uſed in the compoſition of enamels, of whatever ſort of colour you want to make them.

XLII. *To make an enamel as white as milk.*

1. To ſix pound weight of the matter juſt deſcribed, put forty-eight grains of magneſia, prepared as follows.

2. Put in an iron ſpoon, to the reverberating fire, the bits of magneſia, rough as it comes from the mine. When it is whitened, pour good vinegar over it, then break it ſmall, and waſh it ſeveral times with warm water. Dry, pulveriſe, and ſift it, then preſerve it in a covered pot for uſe.

3. This magneſia, and primary enamel matter, you put, in the above-preſcribed proportion, in a crucible, on a glaſs-melting fire, then throw the whole contents into clear water: dry it, melt it again, as before, and throw it in water again, and ſo on. This operation repeat three times. Being thus well purified, if you find it not quite white enough, add a little more magneſia, and begin the ſame proceſs as before. Then take it off the fire, and make it into ſmall round cakes.—Such is the method of preparing the enamel to paint with on gold, and other metals.

XLIII. *To*

XLIII. *To make an enamel, turquoise colour.*

Put six pounds of the said enamel primary matter in a varnished crown glass pot. Melt and purge it three times as usual, and prescribed in the preceding article. On the third time project, at four separate times, three ounces of scories of copper, prepared as directed in Art. xliv. mixed with ninety-six grains of zaffar prepared the same way exactly, and in the same manner as the magnesia, and forty-eight of that very magnesia in subtile powder. Stir well the matter on the fire, at the time of each projection, with a long-handled iron hook; and, when the colour seems to be to your liking, take it out of the fire, and make it into small round cakes as usual. This will make a most beautiful turquoise enamel.

XLIV. *How to prepare the scories of copper for the above purpose.*

This preparation is very simple. Wash, first, the scories well, and set them to calcine three days at the entrance of a reverberating furnace. Then grind this and sift it. Calcine again as before, grind and sift the same, repeating this operation three different times. When finished, it is called a calx of copper. Of this mix three ounces with forty-eight grains of prepared magnesia, and ninety-six of zaffar also prepared, for a projection on enamel's primary matter, to make a fine sort of turquoise colour.

XLV. *To make blue enamel.*

Put in a varnished crown glass pot, in a melting-glass furnace, four pounds of common primary enamel matter; two ounces of zaffar; and forty-eight grains of prepared scories of copper, all previously well pulverised and mixed. When this composition is in good fusion, throw it in water, then dry it, and put it again in the same pot. Leave it there till the matter is well incorporated, and proceed as directed for the others.

XLVI. *To*

XLVI. *To make green enamel.*

1. Melt and purge, by the glaſs melting fire, and in a varniſhed crown-glaſs pot, four pounds of the primary enamel matter. Leave it there twelve hours; after which throw it in water, dry it, and put it again in the ſame fire, for the ſame time, to cleanſe it well.

2. Grind into a very ſubtile powder, ſome of the aforeſaid ſcories of copper, and ſome ſcories of iron. Mix theſe powders together, *viz.* two ounces of the former, and forty-eight grains only of the latter; which, being divided into three different parcels, project, at three diſtinct times, on the enamel matter in fuſion, ſtirring well with an iron hook at the time of each projection, that the colour may better incorporate; and in twelve hours afterwards you will find a very fine green enamel.

XLVII. *To make a black ſhining enamel.*

Take of our primary enamel matter in powder, four pounds; red tartar, four ounces; and of our prepared magneſia, in ſubtile powder, two. Put all this into a varniſhed pipkin, ſo large that all theſe powders together ſhall not come higher than the third part of the veſſel, this matter, when melted, ſwells very much. When in perfect fuſion, throw it into water; take it out to dry, then put it again in the pot, and purify it as before. Do ſo till you find it ſufficiently purified; then take the pot off the fire, and the matter out of the pot.

XLVIII. *To make an enamel, purple colour.*

Reduce into ſubtile powder, and mix well together, ſix pounds of our primary and general enamel matter; three ounces of prepared magneſia, and ſix of ſcories of copper, prepared as before mentioned. Melt and purify all this in a varniſhed pipkin, by placing it in a melting-glaſs furnace. When in good fuſion, throw this matter in water; dry it, and put it again in the ſame pot to purify it anew by the ſame proceſs. If you find your colour to your liking, take the pot off from the fire, and keep your enamel for uſe.

XLIX. *Another.*

XLIX. *Another.*

Take ſix ounces of our general matter, two of prepared magneſia, and forty eight grains of the aforeſaid preparation of ſcories of copper. Pulveriſe, and proceed as above. This compoſition will give a very fine purple enamel, fit for all ſorts of works which goldſmiths will employ it in.

L. *A yellow enamel.*

Take, and reduce into a very fine powder, ſix pounds of the general matter; three ounces of tartar, and ſeventy-two grains of prepared magneſia. Put all into a pot large enough not to loſe any thing of the matter when it comes to ſwell at the time of its fuſion.

LI. *To make a cryſtaline matter, which ſerves as a baſis to red-colour enamels.*

1. Take twenty-four pounds of ſalt, drawn from trituration, lotion, filtration, and evaporation; and ſixteen pounds of white tartar, that is to ſay, of white and tranſparent river pebbles, calcined and reduced into an impalpable powder. Both theſe ingredients being equally reduced into a ſubtile powder, mix and wet them ſo as to make a hard paſte of them, of which you will form ſmall thin cakes. Put theſe cakes in pipkins, and place them in a lime, or potter's kiln, where they are to calcine for ten hours.

2. When theſe cakes are well calcined, reduce them into a ſubtile powder, and add four pounds of lead and pewter calx (prepared and ſubtilized as before directed, Art. xli.) and as much white tartar alſo calcined and purified by lotion, &c. (as directed, Art. xxxiv. n. 2.) Theſe three laſt ingredients being reduced into a ſubtile powder, put them in a varniſhed pipkin, and place them in a melting-glaſs furnace, there to be melted and purified, by throwing the compoſition, when in fuſion, into water, then drying, &c. three times; after which the whole is completed.

LII. *How*

LII. *How to make a fine preparation of* fuſible magneſia, *to be employed in the making of red enamels.*

1. Take whatever quantity of magneſia you pleaſe. Add to it an equal quantity of nitre prepared by lotion, filtration, and evaporation. Set this matter in a pipkin to calcine for twenty-four hours, by a reverberating fire. Then take it out, and waſh it with warm water, to cleanſe it from all the nitre, and dry it. When this magneſia be dry, it will be of a very fine red.

2. Now add to it its equal weight of ammoniac ſalt. Grind all well on a marble ſtone, wetting it with diſtilled vinegar, ſo that it comes into a ſort of clear paſte, or colour for painting.

3. Then dry this matter; and, having pulveriſed it, put it a ſublimng in a ſtrong glaſs matraſs, with a long neck and a large belly. Give it the ſublimating fire for twelve hours; break the matraſs; weigh firſt the ſublimed part, and mix it with what remained at the bottom; add as much new ammoniac ſalt as you had weight of ſublimation. Grind theſe well together, wetting them with vinegar, then dry and ſublime again as before. Renew this operation ſo many times as will be requiſite, that the magneſia remain at laſt in a ſtate of fuſibility at the bottom of the matraſs.

4. This liquid is fit for ſtaining cryſtal of a very fine ruby hue; and, when employed with enamels, will render them of a moſt beautiful red.

LIII. *To make red enamel, of a beautiful ruby hue.*

Put twenty ounces of the above fuſible magneſia, to one pound of the cryſtaline matter (Art. li.) in good fuſion. Puriſy the whole well, and try the colour.

Note. According to the proportion of fuſible magneſia you put in this compoſition, you raiſe or lower the hue of your enamel. And, if carried to the degree of rubies, it will prove bright and beautiful.

LIV. *To make an enamel, true* Balais-*ruby colour.*

Take ten pounds of our cryſtalline matter. Purge it in the melting glaſs furnace, by fuſing it, then throwing it in

in water, drying, pulverising, and melting again, &c. three times. Put it again for the fourth time in fusion; and, when in that state, give it the purple colour by means of a proper quantity of fusible magnesia, as mentioned in the preceding article. After this, project on it, at eight different distances of time, as much calcined alum, in subtile powder, as you will find requisite to give it that degree of red hue you desire; which to imitate the *Balais* ruby colour, must be fuller and deeper than that of the clear rubies.

LV. *To make a bright enamel*, escarboucle *colour*.

1. Take very fine gold, one part. Purify it again, and open it in the following manner. Dissolve it in good regal water; distil it first from the gold, and recohobate it six different times. After this, take your gold powder from the vessel, put it in a crucible, covered and luted as usual, and place it in a furnace to the reverberating fire, where it shall be left to calcine till it becomes a very high and deep red, which cannot happen till after several days calcination.

2. Then, by projecting this part of well opened gold on twenty of the beforementioned crystalline matter, previously purged according to direction, and put in a state of good fusion, an enamel will be obtained, of the most beautiful, transparent, *escarboucle* colour.

LVI. *To give rock crystal the various colours of topaz, rubies, opal, heliotrope, and others.*

It is no less true than surprising, that all these different colours are the product of the same materials, and are operated in the same vessel, and at the same time. But as the action of these metallic minerals, which tinge crystal in that operation, is stronger in proportion to the quantity of similar spirits they meet with in ascending to the top of the crucible, so the colours acquire also more strength and vivacity.

1. To make this operation, take two ounces of orpine, of a gold or saffron-like colour; and as much crystalline arsenic; one of crude antimony, and as much of ammoniac

ammoniac salt. Pulverise and mix well. Make a bed of this powder, in a large crucible; over it lay another of rock crystal in bits, chusing the smallest for the first, or bottom bed; and the largest and purest for the higher and last beds. Make thus, *strata super strata*, of your powder and crystals, till you have employed all you have got of them, and take care to end with a bed of powder. The crucible being thus filled, cover it with another, at the bottom of which, now become the upper part, a hole, of about two inches in diameter, being made, in order to give room for the exhalation of the fumes. Lute the joints, and when dry, place the crucible in a furnace, over black charcoals, and range more of them all round it, to the half way of the upper one. Add then some kindled coals, in order to light the others gradually. These coals ought to be large and long, and all of oak wood. Care must be taken to light them very regularly, letting them go out naturally of themselves, and guard yourself carefully from the fumes. As soon as the fire begins to abate, stop the hole of the upper crucible, to prevent the admittance of the cold air, which will break your crystals.

When the crucibles are cold, unlute them, take your crystals, and get the finest and best coloured polished by the wheel. You will find these stones to be very little, if at all, inferior in point of beauty and hardness, to the eastern ones.—This *Secret* has gone through many experiments.

After having given the method of making all sorts of colours, which counterfeit the natural precious stones, the manner of stamping these artificial ones; a *Secret* by which the finest and most precious original cameos and intaglios may be copied in a manner not in the least inferior to the original, and which makes, at this present time, the amusing occupation of most of the ladies and gentlemen at court.

LVII. *The method of counter-drawing on artificial stones, the original cameos, intaglios, and other gems, which are kept and preserved in the several museums of Europe.*

Chuse the finest sort of tripoly which can possibly be found.

found. Grind it on marble, into an impalpable powder, and as ſubtile as poſſible. Add a little water to it, ſo as to make a ſort of paſte with it, of the conſiſtence of colours on pallets for painting. When it is in that ſtate, put it in a little ſquare tin mould, with turned up edges. Preſs well your paſte down in it, and ſmoothen the ſurface. As ſoon as you ſee it begins to dry, ſtamp on it the ſeal of which you want to obtain the impreſſion, and taking it off ſkilfully from the tripoly paſte, let this dry thoroughly. When you find it is perfectly hard, and the ſtrokes of the ſeal are ſolid, put on the impreſſion ſome powder of cryſtal, or any artificial ſtone you pleaſe, whether red, green, or blue, or any other colour. Then, with a metal pipe, blow on that powder the flame of a candle, or a lamp, till the cryſtal is perfectly melted. When done, lay ſomething, ſuch as a ſmall iron pallet, of nearly the ſize of the ſeal, on the melted paſte, and preſs it gently to make it take the better the impreſſion, and all the turns of the deſign, and then let it cool. When you take the cryſtal up, you will find it to be a perfect copy of the original. You may then ſend it to the lapidary to be cut, and ſet for ſeal or ring, as you like. From theſe very copies you may even get other copies, by following the ſame proceſs of operation; but it muſt not be denied, theſe will not be quite ſo perfect as thoſe obtained from the originals themſelves.

Note. When you have made on the tripoly paſte the impreſſion of the original ſeal, the ſafeſt and ſhorteſt way would be to bake it in a furnace, under a tin arch, to prevent the coals from touching the impreſſion, which might hurt and damage the relief. Then take off your mould, and put on the ſtamp, cryſtal powder, or other fuſible matter, you may place it again under the ſame arch, in the furnace, and when that powder is melted, do as before directed.

LVIII. *To jaſper glaſs globes.*

Wet the inſide of a glaſs globe with common water; then throw in ſome powder, blue, or ultramarine, or elſe ſome of the fineſt ſmalt, and ſtir well the globe, that theſe powders may ſtick every where. Then dilute ſome other colours

colours with nut oil, keeping each particular colour by itself. With the downy end of a quill, put some of these colours, one after another, in the globe, touching it every way with them. Put some flour after that in the globe, and shake it so as to make it go all over, and then the work is finished.

LIX. *To give globes a silver colour.*

To four ounces of pewter, in fusion, add two of quicksilver. Stir all well with a wooden spatula; and when the whole is well incorporated, pour some of this compound into your globes, which must previously have been warmed before the fire. Turn them in all manner of directions, that the composition may fix itself better and more equally in all their capacity.—Chop some tinsel very fine, and throw it in the globes when the pewter begins to cool, these little lamians will stick themselves to it, and produce the finest effect imaginable.

LX. *A good method for tinning glass globes.*

Melt together one ounce of tin glass, and half that quantity of pewter and of lead. When both are thus in fusion, throw in some mercury, and the whole into a pan full of water. Pour the water off by inclination, and dry this matter; then pass it through a piece of linen, and roll it in a globe that is very dry in the inside.

LXI. *To make the same in colours.*

To make these globes of what colour you like, mix some mercury with a great quantity of dry common salt, pass it through a piece of linen, beat it in a little chamber lye and water, which will granulate the mercury. If you put this mercury in your globes, just after you have coloured them, (as directed in Art. lvii.) that mercury will fix itself into them, in little grains or globulas all round, and appear like diamonds incessantly sparkling.

LXII. *To stick these globes upon one another.*

Pound into powder half an ounce of dragon's blood, as

as much of bole armeniac, and a little quick lime; which dilute all together with whites of eggs. Then cut a ſwine's bladder into ſmall bits, of the form and ſize of a ſhilling; put ſome of that glue on both ſides of them, and put one thus glued between every two globes, ſupporting them with your hands till you ſee the glue has got hold of the glaſs. In about one hour's time, they will ſtick ſo very hard, that there will be no danger of their parting from each other. Theſe are to be ſuſpended in the air, or laid as ornaments on wainſcotting, cornices, &c.

LXIII. *To make tranſparent frames.*

Boil for a quarter of an hour only, nut oil, ſix ounces; white wax, four; roſin, as much; and Venice turpentine, two. When lukewarm, lay it on with a ſoft bruſh.

LXIV. *Another.*

Soak, for twenty-four hours, a fine white parchment ſkin, in whites of eggs and honey well beaten together. Waſh then your parchment, paſte it on the frame, and when dry, lay a coat of varniſh on it.

LXV. *Another way, which will make the frame look as made of glaſs.*

Take one of the fineſt and moſt perfect ſheets of vellum you can find. Waſh it, paſte it on the frame, and let it dry. Then boil in a glaſs veſſel, over a ſand bath, equal quantities of nut or lintſeed oil, and water, with a little crown glaſs, pounded into a very fine powder. With this you may at any time give a coat to your vellum, and ſee the pleaſing effect it will have.

LXVI. *A white paint to preſerve the putty round the panes of glaſs.*

1. Grind white lead with water. Dry it, and grind it again with oil, then lay a coat of it over your putty. But if you want it to be ſtill more durable, put two coats of it, after having added a part of fœtid oil, made in the following manner.

2. Have

2. Have a leaden plate with turned-up edges to make a border. Fill it with nut or lintſeed oil. Cover it with a piece of glaſs, and expoſe it in the ſun. It will ſoon be fœtid.

LXVII. *To clear glaſs.*

Rub the glaſs cryſtal with a piece of lead; that will make it clear and bright.

LXVIII. *How to diſtinguiſh a true form of a falſe ſtone.*

Warm an iron plate; rub ſome oil over it; ſpread glaſs duſt on the middle, and cover that glaſs with kindled coals. Hold the ſtone you want to try over theſe coals, without letting it touch them. If the ſtone does not loſe its luſtre, and look dull, it is a true ſtone.

LXIX. *Another to the ſame purpoſe.*

Heat the ſtone by rubbing it with a piece of cloth. When hot, rub it with a piece of lead. If there remain any mark of it on the ſtone, it is a falſe ſtone.

LXX. *To make pearls, and ſwell them to what ſize you pleaſe.*

1. Take any quantity of ſeed of pearls. Let them be very white and not perforated. Waſh them well in warm water, and let dry. Pound them in a new marble mortar, very clean and poliſhed. Grind them next on a marble ſtone, into a very fine impalpable and ſubtile powder. Put this powder in a glaſs mortar, and dilute it in a good quantity of mercurial water. Pour this water into another glaſs veſſel. Add more mercurial water to that which remained in the mortar, mix well and pour this water off again. Continue ſo doing till there ſhall not remain any of the pearl powder at all, and that both the pearls and the water ſhall have reciprocally impregnated the ſubſtance one of another.

2. Being ſo far conducted, lay the lid on the glaſs veſſel in which the liquor is contained, and ſet it in the ſun for the ſpace of twenty days. At the end of which term,

you

you may take notice of another liquor, like a greasy oil, swimming on the top of the former. Skim it carefully with a silver or glass spoon, and keep it separately in a phial, to use it in proper time, as shall be directed.

3. This being done, take the vessel in which the former liquor you have skimmed is, and place it in *balneo mariæ* over a gentle fire. When the water of the *balneum mariæ* boils, you will perceive another scum rising to the top of your liquor. Skim it again, and put it carefully in another distinct phial, to be used also when it is proper.

4. What remains at the bottom of the vessel, after this second scum is off, is called *Milk of pearls*; a drug much used among ladies who paint.—So far your materials are all prepared; the question is now to employ them properly; and that you shall find in the following article.

5. Take what kind of pearls you please, or rather happen to meet with; for, how brown, black or imperfect and ugly in every respect they may be, does not signify in the least, provided only they be round if you want them round, or oval if you want them oval. Thread them with a fine silver wire, or swine's hair; then put them to soak for the space of twelve hours, in the *Milk of pearls*. They will suck that liquor, swell, and soften themselves. At the end of twelve hours, take them out from that *milk* by their wire, and suspend them in so large a glass vessel as to have none of them touch any part of it. Cover the vessel with its lid, and set it in the sun for twelve other hours; during which time, they will harden. When they have been there twelve hours, put them again to soak for twelve hours, in the same *milk* as before, to swell again; then, suspend them again in the sun for the same time, and repeat this operation, till the pearls have acquired the size you want them to have. For they will always feed and swell themselves, with that cream, whenever you put them into it.—When they have soaked in it for the last time, and been dried afterwards for twelve hours in the sun, then put them to soak for another twelve hours in the second stuff which you skimmed from the milk of pearls, while it was in the *balneo mariæ*. Then set them again in the sun for twelve hours.—This term being over, put them to soak in the first sort of greasy oil, which you

you ſkimmed for the firſt time from the liquor, after the twenty hours of its having been expoſed in the ſun. And when they ſhall have remained there for twelve hours, and been again expoſed after that, for twelve more out of it, in the ſun, as uſual, you have then got very fine, and exceedingly good pearls; not ſophiſtic, but true and natural; and you may have your own price for them.

6. Of the mercurial water, which is the chief thing, indeed, in this operation, we may ſafely aver, that it is a *ſecret* known by very few, and to thoſe only who are well verſed in the great Art of Chymiſtry. The manipulation deſcribed will undoubtedly afford no little pleaſure and ſatisfaction to thoſe who are acquainted with the proceſs of making mercurial water, and who do not know, perhaps, the precious quality it is inveſted with, of compoſing or ſwelling pearls.

LXXI. *To dye cryſtal ruby hue, with lake.*

1. Take crimſon, or the reddeſt ſort of lake you can find, half a drachm. Put it in a ſquare glaſs phial, and boil it in a *balneo mariæ* for two hours. The lake, thus ſituated in the glaſs for two hours, not being touched by the water at all, but only penetrated by the heat it receives from it, ſhrinks at laſt and becomes fryable. Take it out of the phial, grind it on marble into a ſubtile powder, then add three or four drops of Venice turpentine. Put it again in the ſame phial as before, and boil it one hour in the ſame manner, and your colour is done.

2. To make uſe of it, you muſt hold, with ſmall pincers, your cryſtal over a chafingdiſh, filled with live coals. Then with the point of a wooden ſkewer, take the colour, and lay it on the cryſtal, which being hot, takes it in immediately. Let it cool, and ſet it, and it will look of a very fine red hue.

LXXII. *To make a ſapphire.*

1. Make ſome zaffar red hot in a ſmall crucible. Keep it in that ſituation ſometime, then throw it in the ſtrongeſt vinegar you can find, or in lieu of it, in

houſe

houſe chamber lye. Let it there lay in the coldeſt part of your houſe for one night. Then wipe it well, make it into a very fine powder, by pounding it in a marble mortar, and keep it in a phial cloſely ſtopped.

2. To ten or twelve pounds weight of cryſtal, or tranſparent pebbles calcined, and mixed with ſalt of tartar, in the proportion of three parts of the firſt to two of the laſt, put as much as will lay on a ſhilling of the above prepared zaffar. Mix all with a ſilver ſpoon, then fill with it a pipkin, which put to the melting glaſs fire. Half an hour after it has been in, fill it up again with the ſame powder, and another half hour after the ſame, till it keeps full. Then cover the pipkin well, and ſet it in the furnace the ſpace of four months, at leaſt; for the longer it is kept there, the finer and harder the compoſition will be.—Four or five days, however, after it ſhall have been in the furnace, it will not be improper to take out in a ſpoon ſome of the matter, and ſee whether the colour be to your liking; and if you find it too pale, add a little more zaffar to it; if too dark, ſome cryſtal.

LXXII. *Another compoſition for the ſapphire.*

Take one ounce of calcined cryſtal; two drachms of minium; of lead and ſalt of tartar, about the weight of half a crown each; and three grains of zaffar. Put all into a ſubtile powder, and melt it in a crucible. If in this proportion you find it of too dark a hue, add as much cryſtal more as will bring it to the degree you like to have it.

LXXIII. *To make an amethyſt.*

To ten pounds of cryſtal, or tranſparent pebbles calcined and prepared as before directed (Art. xxiii.) add ſeven ounces of fuſible magneſia, with one of loadſtone, and a little zaffar. Mix all well, and put it in the furnace for one month.

If you add to the green compoſition a little calcined ſilver, you will ſee it ſurpriſing beautiful.

CHAP. VI.

SECRETS concerning COLOURS and PAINTING.

§ I. *To paint in varnish on wood.* (Useful to Carriage Painters.)

I. *The preparations previous to the laying of colours, and the general process observed in laying them on it.*

1. YOU must first lay on the wood two coats of Troyes-white, diluted with size water. Next lay over these a third coat of ceruse. Then mix the colour you want with turpentine oil, add the varnish to it, and lay it on the wood, previously prepared as follows.

2. Polish the wood, first, with shavegrass or horse-tail, and then with pounce-stone. Lay afterwards six or seven coats of colour mixed with varnish, allowing after each coat a sufficient time to dry, before laying on the next; then polish over the last coat with pounce-stone, grinded on marble into a subtile powder. When this is done, lay two or three coats of pure white varnish. As soon as this is dry, rub it over with a soft rag dipped into fine olive oil, then rub it with tripoly reduced into subtile powder; and having wiped with a clean piece of linen, pass a piece of wash leather all over it.

II. *To make a black.*

1. The black is made with lamp or ivory black, grinded on a marble stone, with vinegar and water, till it

it is reduced into the moſt impalpable powder. Keep it in a bladder.

2. There is a ſort of black which, from its hue, may be termed a velvet black. This is made of ſheep trotter-bones, burnt and reduced by grinding, like the other black, into an impalpable powder. Keep it the ſame as the other.

III. *To make a blue.*

Burnt turnſol mixed with quick lime and water, then ſized with leather ſize, makes the blue.

IV. *To make the Gridelin.*

Grind cochineal with white lead and a little Venetian lake. According as you put more or leſs of this laſt ingredient, you make it darker or clearer.

§ II. *To paint on paper.*

V. *For the red.*

To make a red, take flat, or Venetian lake and Braſil wood, and boil all together, with an addition of black lead.

VI. *To make a fine yellow.*

You muſt boil ſome kermes in water impregnated with orpine.

VII. *To make a green.*

A mixture of verdigreaſe, ſap green, Hungarian green, and *terverte*. The whole grinded on marble with a pretty ſtrong leather ſize.

VIII. *To transfer a print on vellum, and then paint it.*

Chuſe your print, and fit a ſheet of tranſparent, or varniſhed paper to it, for width and breadth. Lay it on the print, and fix it by the four corners and the mid-

dle part of the four edges, on that print, by means of a little white wax, the bulk of a pin's head. Then with a very fine lead pencil, ſketch out on the varniſhed paper, all the outlines and turns of the print which you plainly ſee through. When done, rub the back of this varniſhed paper all over with red chalk, and carrying it on the vellum, fix it on it, as you did on the print. Then with a wooden or ivory blunt point paſs, over all the ſtrokes which are delineated on the varniſhed paper, the red chalk of the back will ſet off in all thoſe parts, and lie on the vellum, whereon you will find the print perfectly ſketched, and fit to receive what colours you like.

§ III. *Compoſitions for Limners.*

IX. *How to prepare colours for limning.*

Moſt colours are prepared, or grinded with gum-arabic. Ochre makes the yellow; *courant mourant*, the white; verdigreaſe, the green; ceruſe, the grey; lamp black, the black; cinnabar, the red; and gold in ſhell, the gold.

X. *To make what is called* lamp-black.

Put a large wick of cotton in a lamp filled with nut oil, and light it. Prop over the flame an earthen diſh, and now and then viſit this diſh, and gather all the black which fixed itſelf to it.

XI. *Another way of making black.*

Burn ſome nut ſhells in an iron pan, and throw them in another full of water. Then grind them on marble with either oil or varniſh.

XII. *To make a blue.*

Whitening grinded with verdigreaſe will make a very fine blue.

XIII. *To*

XIII. *To make a turquin blue.*

German turnſol infuſed for one night in chamber-lye, then grinded with a diſcretionable quantity of quicklime, in proportion as you want to have it paler or darker.

XIV. *A fine green for limning.*

Grind ſome verdigreaſe with vinegar, and a very ſmall quantity of tartar; then add a little quick lime and ſap-green, which grind with the reſt, and put in ſhells for keeping. If it become too hard, dilute it with a drop of vinegar.

XV. *Another for the ſame purpoſe.*

Grind on a marble ſtone, verdigreaſe, and a third of tartar, with white wine vinegar.

XVI. *To make* Sap-green, *or blackberry green.*

Expreſs the blackberry juice, when full ripe. Add ſome alum to it, put all in a bladder, and hang it in the chimney to dry.

XVII. *To make lake.*

Take three parts of an ounce of Braſil wood; a pint of clear water; one drachm and a half of roch-alum; one dozen and a half of grains of ſalt of tartar; the bulk of two filberts of mineral cryſtal; three quarters of a pound of the whiteſt ſound, or cuttle-fiſh bones, raſped. Put all together in a ſaucepan to boil, till reduced to one third. Strain it three times through a coarſe cloth. To make a finer ſort, ſtrain it four times. Then ſet it in the ſun under a cover to dry. That which dries the ſooneſt is the fineſt.

XVIII. *To make a liquid lake.*

Pound ſome cochineal and alum together; then boil them with a quantity of lemon-peels cut very ſmall. And when it is come to the right colour you want, paſs it through a cloth.

XIX. *Another way.*

On a quantity of alum and cochineal pounded and boiled together, pour drop by drop, oil of tartar, till it comes to a fine colour.

XX. *For the vermilion.*

Vermilion becomes very fine in *aquavitæ*, or in child's urine. But it will be ſtill finer, if you put it in *aquavitæ* with a little ſaffron. It is uſed with whipped whites of eggs.

XXI. *For the making of carmine.*

1. Boil two quarts of ſpring water in a varniſhed pipkin; and, when it boils, throw in ſeven pugils of pulveriſed *chouam*. After this has thrown two or three bubbles, take it off the fire, and decant it in another clean pipkin. Then put in this water five ounces of cochineal in powder, and boil it for a quarter of an hour. Add three pugils of *autour*, in fine powder, and make it throw four bubbles. Then add three pugils of Roman alum in powder, and take it out directly from the fire, which muſt be made of live coals.

2. Strain all through a linen cloth, and divide this liquor into ſeveral delph veſſels, and ſo let it remain for three weeks. At the end of that term pour off the water by inclination. You will find under a kind of mouldineſs, which you muſt carefully pick off, and then gather the carmine.

Note. Every five ounces of cochineal give one of carmine. It is to be grinded on marble.—A general opinion prevails, that this operation is beſt done in the creſcent of the moon. How far it is needful to obſerve this precept, is left to the wiſe to determine.

XXII. *Colours fit for expreſſing the various complexions.*

1. For women and children; mix a little white and a little turnſol.

2. For men; a mixture of white and vermilion is proper.

3. For old folks; you muſt uſe ſome white and ochre.

4. For

4. For horſes; you muſt chuſe biſtre, ochre, and white. —The dark brown horſes require a little addition of black. —The gray want nothing but biſtre and white.

§ IV. *To make tranſparent colours.*

XXIII. *For the green.*

Put in very ſtrong vinegar, verdigreaſe, rue-juice, and gum-arabic. Set this in the ſun for a fortnight, or, if you have no ſun, boil it on the fire. Strain it, bottle and ſtop it—Shake it well before uſing.

XXIV. *For the red.*

Make a lye with ſalt of tartar. In it, put to infuſe for one night, ſome India wood, with a little alum. Boil all, and reduce to one third. Run it through a linen cloth, and mix ſome gum-arabic with it—With more or leſs alum, you make it of a higher or paler hue.

XXV. *For the yellow.*

Bruiſe Avignon ſeed, called *French Berries*, and put it in a lye of ſalt and tartar to boil on the fire, to the reduction of two thirds. Run it, and boil it one bubble more. Then bottle and cork it—It muſt be ſhaken before uſing —A ſmall addition of ſaffron renders it more lively.

XXVI. *For the blue.*

Soak in chamber-lye, one night, a quantity of German *Palma Chriſti*. Take it out and grind it with a little quick lime—More or leſs quick lime will raiſe or lower it in hue. And nothing more is required to dilute it than chamber-lye and gum arabic.

XXVII. *Another blue, very like ultramarine.*

Grind ſome indigo on porphyry with turpentine oil. Put it afterwards in a glazed pipkin, and lute it well. Let it thus lay for the ſpace of ſix weeks. The longer you leave it there, the more blue it will be.

XXVIII. *A pale red, to paint on enamel.*

1. Take the filings of a piece of good iron. Put them in a matrafs with *aquafortis*, and fet it on a flow fire. Let it boil gently till the filings are all diffolved.

2. When this is done, pour a little warm water into the matrafs, and let it remain a few hours on the fire, then pour all into another veffel. When the liquor fhall be quite clear, decant it out gently, and leave the powder, which is at the bottom, to dry.

3. Put this dried powder in a new crucible well covered and luted, and then neal it gently on a very regular fire; and, a little while after, take it out and let it cool.

4. Now one drachm of that powder, and three of yellow Dutch beads ground with maftich-oil, will give full fatisfaction.

XXIX. *Procefs of making purple, for painting an enamel.*

1. Take one drachm of very fine gold, forged weak. Cut it in fmall bits, and neal it. Put that gold into a matrafs, with one ounce of ammoniac falt, and two of good *aquafortis*, and fet it on a gentle fire to run all into liquor.

2. Have two ounces of clear water, near boiling, and throw it in the matrafs. This done, pour the whole in a glafs phial of more than a quart fize, to which add one ounce and a half of oil of tartar drop by drop. It will occafion an ebullition, which being ceafed, you muft fill the bottle with water, and let it reft till the gold falls to the bottom.

3. When the water is quite clear, decant it out gently, for fear of difturbing the gold and lofing it. Then fill the bottle with new water, repeating this operation till the water is as clear when you decant it out, as when you put it in, and has no more fmell.

4. Take your gold out of the bottle, and put it on a fine brown paper, folded in four or five doubles, and turned up by the edges, in form of a little cafe or mould. There let it dry; and, when dry, keep it for ufe.

5. Grind,

5. Grind, next, some fine white frost-glass; mix it with water, put it in a bottle, and shake it, then let it settle. When this powder is fallen to the bottom, decant off the water, and let the powder dry in the vessel.

6. The proportion to make the purple colour. Take three grains only of your aforesaid gold dust to thirty of the white frost-glass, thus prepared. Mix both in a calcedony mortar with clear water. After the powder has settled to the bottom of the mortar, decant out the water, and let the powder dry in the mortar.

7. This done, take the powder out of the mortar, and putting it on a white bit of paper, dry it by a slow fire, till you see it has acquired a fine purple hue.

8. Grind, now, this powder with a little oil of spike, and put it in little cases made with cards, of which the edges are turned up. When the card has soaked the oil, the whole operation is accomplished—Preserve it by putting it in small boxes, in a dry place.

XXX. *How to make a fine flesh colour.*

9. The mere addition of a little black to the above composition will make the finest colour for complexions, or flesh-colour, and may justly be deemed a ninth article in the process which is to be observed in its fabrication.

XXXI. *A good way to make carmine.*

Make a little bag, tied very close, of fine Venetian lake. Put it in a little varnished pipkin, with rain-water and cream of tartar, and boil it to a sirup. Thus you will have a fine carmine colour.

XXXII. *Another way.*

Grind dry, on porphyry, some of *coccinella ursula*, sugar-candy, roch-alum, and gum-arabic, all nearly in equal quantities, except the gum, of which you put a little less. Put these powders into a glass phial, and pour over a sufficient quantity of brandy to cover them, and squeeze over the juice of a lemon. Stop well the bottle, and set it in the sun for six weeks. Run the colour

into ſhells, taking care that none of the ground ſhould run out with it.

XXXIII. *The whole proceſs of making ultramarine.*

1 Make ſome of the browneſt *lapis* red hot in a crucible, then throw it into vinegar. Repeat this three times. When calcined, pound it in a mortar, and ſift it. Then grind it on porphyry, with a mixture of lintſeed oil and ſpirit of wine, in equal quantities, and previouſly digeſted together in a matraſs, and often ſhaken to prepare them for this uſe. When you ſhall have ſubtilized your *lapis* powder, then incorporate it with the following cement.

2. Lintſeed oil, two ounces; Venice turpentine, three; maſtich, half a one; *aſſa fætida*, two; black roſin, as much; wax, half an ounce; yellow roſin, three. Boil all in a glazed pipkin, for a quarter of an hour; then run it through a cloth into clear water. Take it out of that water; and, taking of this, and of the grinded *lapis*, equal quantities, incorporate them in a glazed pan, and pour ſome clean warm water over, and let it reſt for a quarter of an hour. Stir this water with a wooden ſpatula; and in another quarter of an hour you will ſee the water all azured. Decant, gently, that water into another glazed pan. Pour new warm water on the grounds, and proceed as before, continuing to ſtir and beat it well; then decant again this new azured water with the former. Repeat doing ſo, till the water is no more tainted with any azurine particles—When done, ſet your azured waters in evaporation, and there will remain at the bottom a very fine Azure of Ultramarine, *viz.* four ounces of it for every one pound of compoſition. Of the remainder you may make what is called *cender blue*.

XXXIV. *Another very fine ultramarine.*

Take the fineſt *lapis lazuli* you can find; break it in little bits, and make it red hot in a crucible, between blaſting coals. When red hot, throw it in white wine vinegar; then dry it and pound it in a marble mortar with a wooden peſtle. Should it not pound eaſily, calcine it again as before, and throw it again in vinegar,

&c.

&c. then try it in the mortar, and if it do not pound yet, repeat again the same process, till it easily submits to be pulverised. After it has been put into a fine powder, grind it on a porphyry stone, with good *aquavitæ*, till it is impalpable. Then gather it up in little cakes, which set a-drying on paper of slates. When dry, if you pulverise it, you have a fine ultramarine.

XXXV. *A very good and experienced pastil to make ultramarine of—The doses as for one pound.*

Take nut or lintseed oil, three ounces; new wax, and fine rosin, three ounces of each; rosin, one; Burgundy pitch, four; *oliban*, otherwise male frankincense, two drachms; dragon's blood, one. Melt all these ingredients, one after another, in the same order as they are here prescribed. That is to say, put in a varnished pipkin, the oil first; and when a little warm, put in the rosin by little bits. This being dissolved, put in the chalk pulverised, pouring it gently, and by little at a time, lest it should blaze. As soon as the rosin is melted, pour the rosin in powder, and by degrees. Next add the Burgundy pitch, broken in small bits, by little at a time; and when all are introduced and well dissolved, add gradually the dose of dragon's blood powder, and let it dissolve like the other drugs—Stir this composition with a stick, by means of which you are to judge whether or not your pastil is done. To know it, let a drop fall from the stick into a pan of water; then, working it between your fingers, you see whether or not it stick to them. If it stick, the pastil is not done, and you must let it remain longer on the fire; then repeat the trial till it does not stick to your fingers, as a proof of its being arrived at its degree of perfection.—Throw it in a glazed pipkin filled with cold water; and when it becomes a little cold, make it into a ball with your hands, which you shall have previously greased with lintseed oil. Then you may keep it as long as you please for use. Stay, however, three or four days, before using it the first time.

XXXVI. *The way of mixing the* lapis *with the paſtil to make ultramarine.*

1. Dilute, as thick as you can, a quantity of the beforementioned impalpable powder of *lapis lazuli*, with a liquor made of two parts of *aquavitæ*, and one of lintſeed oil.

2. Melt in another glazed pan, without the aſſiſtance of water, and over a gentle fire, the paſtil deſcribed in the preceding receipt.—Obſerve that your paſtil be perfectly purified from any particles of water it might have carried away with it, when you threw it in water in order to form it into a ball.

3. When the paſtil is melted, throw into it the thick paſte you had previouſly made of *lapis lazuli* with brandy and lintſeed oil. Stir and mix this ſo well, that the whole be moſt perfectly united and incorporated. Then let it remain twenty-four hours, and cover it well for fear of duſt.

4. After twenty-four hours are elapſed, put in this pan a quantity of lukewarm water, proportionable to that of the matter, and work well the whole together with two wooden peſtles, till the water becomes quite blue, which you will immediately decant off into a china baſon, and cover carefully for fear of duſt.

5. Put new lukewarm water again on the ſame paſtil. Work it anew as before, and proceed the ſame as the firſt time.—Repeat this operation as many times as you find the water coming blue, and till you perceive it begins to turn gray or white, which is a convincing proof that there is no more good in the paſtil.—Be careful to range in order the different bowls in which you have decanted your tinged waters; and, to avoid miſtakes, number them by firſt, ſecond, third, &c.

6. Let theſe waters ſettle, and when quite clear as when you put them in, decant them again with all the gentleneſs poſſible, each into another ſimilar veſſel, for fear of loſing any of the ultramarine which lies fixed all round the ſides and bottom of the bowls, and might be, though never ſo little, carried off with the decanted waters. When theſe waters are duly decanted off, cover again, carefully, the bowls, for fear of the duſt, and let the ultramarin,

tramarine, which lies round them, dry perfectly. When dry, brush it down gently to the bottom, with a new soft hair brush, and gather your powders separately with the same numbers on each parcel, agreeable to that of the bowls, whence they come.

7. The first ultramarine is the finest; the second is not so much so as the first; neither is the third so fine as the second. And it goes thus, decreasing in beauty, merit, and value.

Observations on the above process.

1. Ultramarine might be drawn from the pastil, by working it with the hands instead of pestles. But, as it fatigues a great deal more the articulations by that sort of working, than by the other, there is room to think, that by this mode of proceeding, each single operation might be attended with some imperfection; which is the reason why the pestles are preferable.

2. Some people make their *lapis* red-hot on bare coals, then steep it in distilled vinegar, repeating this several times till it becomes fryable.

3. But it is much preferable to make it red hot in a crucible; because, should the fire make it split, the bits will remain in the crucible. Now it need not be wondered at if it does, particularly when calcinations are often repeated.

4. The *lapis*, which is of a fine blue, and striped with gold or silver, is the best to make ultramarine of.

5. The *lapis* is also reckoned to be of a good quality, when it preserves its fine colour, even after it has been made red-hot in blasting charcoals.

XXXVII. *Another secret to compose a fine blue, for washing, in drawings, instead of ultramarine, which is too dear, and too strong to be used for that purpose.*

1. Gather in the summer, a large quantity of blowart, which grows in the fields among the corn. Pick well their blue leaves off. Have lukewarm water impregnated with impalpable powder of alum. Put the picked blue leaves into a marble mortar, with a sufficient quantity of that

that alum water, to ſoak them only. Then, with either a wooden or marble peſtle, pound them, till the whole is ſo maſhed, as to give the juice by expreſſion through a new cloth. Then ſtrain it over a glaſs bowl, in which there is water impregnated with the whiteſt gum-arabic you can find.

2. Obſerve that you muſt not put much alum in the firſt water, if you are deſirous of preſerving the brightneſs of the colour: for by putting too much of that ingredient, as well as for the water impregnated with it, you darken the tone of the colour.

3. *Note.* By means of the ſame proceſs, you may likewiſe draw the colours from every flower which has any great eclat. You muſt not neglect to pound them with alum water, which prevents the colour from ſuffering any alteration; as it ſometimes happens at the very firſt bruiſe.

4. To render theſe colours portable, ſet them a-drying in the ſhade, in glaſs veſſels, well covered, to fence them againſt the duſt.

XXXVIII. *The true ſecret of making* Iris-*green.*

1. Take a large quantity of the flowers of that name in the ſpring. Pick them; that is to ſay, pick out the green and the yellow, which are at the bottom of the petal of the flower. Next to this, pound them in a marble mortar, with a little lukewarm water, impregnated with alum. When pounded, expreſs the juice through a new cloth, over a china bowl. Then mix ſome gum-arabic water with it.

2. If you want a tone of colour different from the natural colour of the flower, you may change it by only adding, after the flowers are pounded, a little quick-lime duſt in the mortar, and give two or three ſtrokes of a peſtle more to the whole; then ſtrain it.

3. *Note.* If you ſhould pound theſe flowers in a wooden mortar, you muſt be cautioned at leaſt to take care it ſhould not be one of walnut-tree wood, becauſe it is apt to tarniſh the colours, and deſtroy their brightneſs,

neſs, which is one of the chief things always required in colours.

4. In the month of March, you may by means of the ſame proceſs, obtain the colour from garden, or double violets. But this is never ſo fine nor ſo lively.

XXXIX. *To make a dark green, for miniature pictures, waſhing on paper, on draperies and terraces.*

Take, towards the end of autumn, a good quantity of wallwort ſtalks, with their fruits on them, and very ripe. Let them rot for five or ſix days in the cellar; and when you ſee the fruits have fomented ſufficiently to give eaſily their juice by expreſſion, ſtrain it through a new cloth in alum-water. Divide the whole into ſeveral glaſs tumblers, to dry it more eaſily. Set them in the air, but not in the ſun, and lay ſome paper over them to prevent any thing from falling into the glaſſes, but which ſhould not at the ſame time ſtop the exhalation of the liquor, and thereby cauſe it to become mouldy. By theſe means, you ſhall have a colour fit for the waſh of a green hue, and dark at the ſame time.

XL. *To make the Biſtre for the waſh.*

1. Grind, on marble, with child's water, ſome chimney-ſoot. Mullar it as fine as poſſible. When done, put it in a wide-mouthed bottle, which fill up with clear water; and then, ſtir and mix all well with a wooden ſpatula. Let the coarſeſt parts ſettle to the bottom of the veſſel. Decant out the liquor gently into another veſſel. What remains in the bottom is the coarſeſt biſtre.

2. Proceed the ſame with reſpect to the ſecond bottle, and after having left this to ſettle for three or four days, inſtead of half an hour, decant it into a third. This gives you the fineſt biſtre.

3. In the manipulation of all the colours which are intended to ſerve in drawing for waſh whenever you will not have them riſe thick above the ſurface of the paper, which would undoubtedly look very bad; for the neatneſs required in a draught, forbids the uſe of any coarſe colour.

XLI. *The*

XLI. *The ſecret for a fine red for the waſh.*

1. Make a ſubtile powder with cochineal. Put it in a veſſel, and pour roſe-water over it as will exceed above it by two fingers.

2. Dilute calcined and pulveriſed alum, while it is quite warm, into plantain water, and mix ſome of the liquor in which you have diſſolved the cochineal.

3. This proceſs will give you a very fine red, much preferable for the waſh, to that which is made with vermilion, becauſe this laſt has too much conſiſtence, and beſides tarniſhes too ſoon, on account of the mercury which enters into its compoſition.

XLII. *A ſecret to make carmine at a ſmall expence.*

Break and bruiſe in a bell-metal mortar, half a pound of gold colour Fernambourg Braſil. Put this to infuſe with diſtilled vinegar in a glazed pipkin, in which boil it for the ſpace of a quarter of an hour. Strain the liquor through a new ſtrong cloth: then ſet it again on the fire to boil. When it boils, pour on it white-wine vinegar, impregnated with Roman alum. Stir well with a wooden ſpatula, and the froth that will ariſe is the carmine. Skim it carefully in a glaſs veſſel, and ſet it to dry.

§ V. *Compoſition of colours, to dye ſkins or gloves.*

XLIII. *A lively Iſabel.*

To make a lively Iſabel colour, you muſt, to a quantity of white, add one half of yellow, and two thirds of red and yellow.

XLIV. *For a pale filbert colour.*

1. Take burnt umber; a little yellow, very little white, and ſtill leſs red.

2. This is made darker, by adding a quantity of burnt umber, as much yellow, a little white, and as much red.

XLV. *For*

XLV. *For the gold colour.*

To much yellow, join a little more red; and this mixture will give you a very fine bright gold colour.

XLVI. *For the flesh colour.*

To imitate well the complexion, or flesh colour, you mix a little white and yellow together, then add a little more red than yellow.

XLVII. *The straw colour.*

Much yellow; very little white; as little red, and a great deal of gum.

XLVIII. *A fine brown.*

1. Burnt umber; much black chalk; a little black, and a little red; will make a fine brown, when well incorporated together.

2. The same is made paler, by decreasing the quantity of black chalk, and no black at all in the above composition.

XLIX. *To make a fine musk colour.*

Take burnt umber; very little black chalk; little red and little white. These ingredients well mixed will produce as fine a musk colour as ever was.

L. *To make a frangipane colour.*

1. This is made with a little umber; twice as much red, and three times as much yellow.

2. The paler hue of it is obtained by adding only some white, and making the quantity of red equal to that of yellow.

LI. *An olive colour.*

To make the olive colour, take umber, not burnt; a little yellow; and the quarter part of it of red and yellow.

LII. *How*

LII. *How to make ſkins and gloves take theſe dyes.*

Grind the colours you have pitched upon with perfumed oil of jeſſamine, or orange flowers. Then range the grinded colour on a corner of the marble ſtone. Grind of gum-adragant, an equal quantity as that of the colours, ſoaking it all the while with orange flower water. Then grind both the gum and the colour together, in order to incorporate them well.—Put all into a pan, and pour a diſcretionable quantity of water over it, to dilute ſufficiently your paſte. Then with a bruſh, rub your gloves or ſkins over with this tinged liquor, and hang them in the air to dry. When dry, rub them with a ſtick. Give them again, with the ſame bruſh, another ſimilar coat of the ſame dye, and hang them again to dry. When dry for this ſecond time, you may dreſs them, the colour is ſufficiently fixed, and there is no fear of its ever coming off.

LIII. *To varniſh a chimney.*

Blacken it firſt with black and ſize. When this coat is dry, lay another of white lead over it, diluted in mere ſized water. This being dry alſo, have verdigreaſe diluted and grinded with oil of nuts and a coarſe varniſh, and paſs another coat of this over the white.

§ VI. *To colour, or varniſh copperplate prints.*

LIV. *To varniſh copperplate prints.*

1. Have a frame made preciſely to the ſize of your print. Fix it with common flour-paſte, by the white margin on that frame. Let it dry, then lay the following tranſparent varniſh on it, which is to be made without fire.

2. Dilute in a new glazed pipkin, with a ſoft bruſh, as big as your thumb, about a quarter of a pound of Venice turpentine, and twopenny worth of ſpike, and turpentine oils, and half a gill, or thereabouts, of ſpirit of wine.——This varniſh being no thicker than the

the white of an egg, lay with your brush, a coat of it on the wrong side of the print; and, immediately another on the right. Then set it to dry, not upright, but flat. And, if it should not dry quick enough, pass a light coat of spirit of wine on the whole.

LV. *How to colour these prints, in imitation of pictures in oil colours.*

1. To paint these prints, you must work them on the back in the following manner. Prepare first your colours on a pallet, and then proceed thus:

2. The flesh-colour is made with a little white and vermilion, which mix with your pencil according to the degree of redness you will have it.—For the green of tree-leaves, you must have mountain-green, ready prepared from the colourman; and for the finest green, some verdigrease. As for the lighter shades of these colours, you only add some yellow to either of the above two, more or less, according to the circumstances.—To paint woods and trunks of trees, nothing more is required than umber.—To express sky-colours and clouds, you mix some blue cerusse with white lead; and with these two colours only, you alter your blues to various degrees of shades, diminishing or augmenting one of the two, according to the darkness or lightness of the skies which you want to express. For the distances, a mixture of yellow and white lead, and so on for the other colours you may want.

3. You are to compose them yourself on the pallet with the pencil; and to mix or unite them, use a little oil of nuts, which take up with the point of the pallet-knife. Then with the pencil, you apply them on the wrong side of the print.

LVI. *A varnish which suits all sorts of prints and pictures; stands water, and makes the work appear as shining as glass.*

Dilute one quarter of a pound of Venice turpentine, with a gill, or thereabouts, of spirit of wine. If too thick, add a little more of this last; if not enough, a little of the former, so that you bring it to have no more thickness

thickneſs than the apparent one of milk. Lay one coat of this on the right ſide of the print, and when dry, it will ſhine like glaſs. If it be not to your liking, you need only lay another coat on it.

LVII. *To make appear in gold the figures of a print.*

1. After having laid on both ſides of the print, one coat of the varniſh deſcribed in the above *Art.* lvi. in order to make it tranſparent, let it dry a little while. Then before it is quite ſo, lay ſome gold in leaves on the wrong ſide of the print, preſſing gently on it with the cotton you hold in your hand. By theſe means all the parts, whereon you ſhall lay theſe gold leaves, will appear like true maſſive gold on the right ſide.

2. Now when this is all thoroughly dry, lay on the right ſide of it, one coat of the varniſh deſcribed in the preceding *Art.* lvi. it will then be as good as any crown-glaſs. You may alſo put a paſte board behind the print, to ſupport it the better in its frame.

LVIII. *A curious ſecret to make a print imitate the painting on glaſs.*

Chuſe a crown-glaſs of the ſize of your print; and lay on it two coats of the following varniſh:

1. Put on the fire, in a glazed pipkin, and let boil for the ſpace of one hour. Venice turpentine, four ounces; ſpirit of the ſame, and of wine, equal parts, one ounce and a half of each; maſtich in tears, two drachms.

2. After it has boiled the preſcribed time, let it cool, and then lay the firſt coat on the glaſs; this being dry, lay another; and, as ſoon as this is nearly dry, then lay on it, as neatly as poſſible, the print, previouſly prepared as follows.

3. Have a glazed veſſel ſo broad at bottom as to admit of the print flat with all eaſe in its full ſize. Let this veſſel be alſo as wide at top as it is at bottom, that you may get the print in and out of it on its flat, without bending it in the leaſt. Pour *aquafortis* in this pan or veſſel, enough to cover all the bottom, then lay the engraved

graved ſide of your print on that *aquafortis*. Take it out and wipe the *aquafortis* off gently with ſoft rags, then ſteep it two or three times in three different clean freſh waters, and wipe it each time in the ſame manner.

4. This being done, lay the right ſide on the before-mentioned glaſs, before the ſecond coat of varniſh be quite dry, and while it is ſtill moiſt enough for the print to ſtick upon it uniformly, equally, and ſmoothly, without making any wrinkles or bladders. When it is perfectly dried in that ſituation, wet your finger in common water, and moiſtening the print on the back part in all the white places, which have received no impreſſion from the engraving of the plate, rub it all off. By theſe means, there will remain nothing but fairly the printed parts. On them you may paint in oil with a bruſh, and the moſt bright and lively colours; and you will have pictures, on which neither duſt nor any thing elſe will be able to cauſe any damage. To do this, there is no need of knowing, either how to paint or draw.

LIX. *Another to the ſame purpoſe.*

1. Heat before the fire, a crown glaſs of the ſize of the print, and then rub it over with Venice turpentine, which, on account of the heat of the glaſs, will ſpread the more eaſily.

2. Boil next your intended print in ſpirit of wine, for about half a quarter of an hour; and then lay it by the right ſide on the glaſs.

3. This glaſs being cold, wet your finger, and moiſtening the back of the print, ſcrape with your nail, the paper off the glaſs, ſo that there remain nothing but the ſtrokes of the engraving.

4. Boil in a matraſs, for about a quarter of an hour, or rather more, and in *balneo mariæ*, one part of turpentine with four of ſpirit of wine. Then lay two coats of this compoſition on the back of the print, after you have ſcratched off all the paper, and allowing time between each coat to dry.

5. As ſoon as the ſecond coat is dry, you may lay on water-

water-colours on the print, according to taſte and judgment, agreeable to the beauty of the prints uſed.

LX. *The method of chalking, for thoſe who are not acquainted with drawing.*

They who are not acquainted with the principles of drawing, may amuſe themſelves with chalking ſome beautiful prints, on white paper, where they ſhall have nothing more to do afterwards than ſhade, in the ſame manner as they ſee done in the original. When they ſhall have practiſed for a while in that way, they will ſoon become able to ſtrike out themſelves ſome good piece or deſign. And to obtain that point, the following method is recommended.

1. With a ſoft, and one of the beſt black lead pencils, rub one ſide of a white ſheet of paper, cut to the ſize of the print, ſo that nothing of the paper can be ſeen, and only the black lead colour.—Lay this ſheet on the clean ſide, upon the face of the print, that it may not ſoil it; and on this ſheet, the black ſide of which now lies uppermoſt towards you, lay another ſheet of clean paper, and fix theſe three ſheets together by the four corners, and on the edges with fine pins, ſo that the ſheets may not vary one from another, which would quite confuſe and mar the whole deſign.

2. Now take a blunted needle, or ivory point, and ſlip it, in preſſing gently all over the turns of the prints, going gradually and orderly for fear of forgetting ſome places, which may be prevented by laying a flat ruler acroſs the print under your hands. When the whole is finiſhed, unpin the papers; and, on the under part of that which lays at top, you will find all the outlines of the print moſt exactly drawn.

3. You may now on theſe outlines, paſs a ſtroke with India ink and a bruſh, or with ink and a pen; after which, with a crumb of ſtale bread, you rub off clean all the uſeleſs marks of the pencil, and leave none but thoſe marked with ink. And to ſhade this deſign, waſh it with India ink, or colours, and a bruſh.

LXI. *To*

LXI. *To prepare a tranſparent paper to chalk with.*

In order to obtain the art of chalking neatly, and not to go out of the fine turns and outlines of a drawing, beginners ſhould firſt know how to prepare a tranſparent paper, which, as it lets them ſee the minuteſt parts of the ſtrokes as through a glaſs, gives them of courſe an opportunity of acquiring by practice, a correctneſs in the expreſſion of all the turns of drawing. This preparation is as follows.

1. Have, one or ſeveral, ſheets of fine and very thin paper, and rub them over with oil, or ſpirit, of turpentine, mixed in double the quantity of oil of nuts. To cauſe the paper to imbibe that mixture, ſteep a ſponge or feather in it, which paſs on both ſides of the paper, and then let it dry.

2. When you want to uſe it, lay it on a print. Then, with a bruſh, a pencil, or a pen, paſs over all the ſtrokes, lines, and turns, of the deſign laid under. You may even thus learn to ſhade with neatneſs, if you waſh that ſame deſign, while fixed on the original print, with India ink.

By practiſing often you may learn to draw very neatly, and even with boldneſs. This method will certainly prove very uſeful, and entertaining, for thoſe who have not the patience to learn by the common method, which ſeems too tedious to ſome, and generally diſguſts beginners.

§ VII. *For painting on glaſs.*

LXII. *How to draw on glaſs.*

Grind lamp-black with gum water and ſome common ſalt. With a pen or hair pencil, draw your deſign on the glaſs, and afterwards ſhade and paint it with any of the following compoſitions.

LXIII. *A colour for grounds on glaſs.*

1. Take iron filings and Dutch yellow beads, equal parts. If you want it to have a little red caſt, add a little copper

copper filings. With a ſteel mullar grind all theſe together on a thick and ſtrong copperplate, or on porphyry. Then add a little gum-arabic, borax, common ſalt and clear water. Mix theſe a little fluid, and put the compoſition in a phial for uſe.

2. When you come to make uſe of it, you have nothing to do but with a hair pencil lay it quite flat on the deſign you had drawn the day before; and having left this to dry alſo for another day, with the quill of a turkey, the nib of which ſhall not be ſplit, you heighten the lights in the ſame manner as you do with crayons on blue paper. Whenever you put more coats of the above compoſition one upon another, the ſhade, you muſt be ſenſible, will naturally be ſtronger. And when this is finiſhed, you lay your colours for garments and complexions as follows.

LXIV. *Preparation of lake, for glaſs.*

Grind the lake with a water impregnated with gum and ſalt; and then make uſe of it with the bruſh—The ſhading is operated by laying a double, treble, or more coats of the colour, where you want it darker. And ſo it is of all the following compoſitions of colours.

LXV. *Preparation of the blue purple, for glaſs.*

Make a compound of lake and indigo, grinded together with gum and ſalt water; and uſe it as directed in the preceding article.

LXVI. *Preparation of the green for glaſs.*

Indigo mixed with a proportionable quantity of gamboge, and grinded together as above, will anſwer the intended purpoſe.

LXVII. *Preparation of the yellow for the ſame.*

Gamboge grinded with ſalt water only.

LXVIII. *Preparation of the white.*

You have only to heighten much the white parts with a pen.

LXIX. *The*

LXIX. *The proper varnish to be laid on glass after painting*

Boil oil of nuts, some litharge, lead filings, and white copperas calcined. When done and cold, lay it all over the colours which you put on the glass.

LXX. *How to paint on glass without fire.*

Take gum arabic and dissolve it in water with common salt, bottle, and keep it. With this liquor, if you grind the colours you intend to paint with, they will fix and eat in the glass. Should you find they do not enough, increase only the dose of salt.

§ VIII. *Preparations of colours of all sorts for oil, water, and crayons.*

LXXI. *An oil to grind colours with, when the works are much exposed to the injuries of the weather.*

Take two ounces of mastich in drops, very clear, and grind it with linseed oil. Then put in a well glazed pipkin any quantity of that oil, and set it on the fire to boil. By little and little introduce in that boiling oil the above prepared mastich, stirring well the whole to mix and incorporate the better. When done, take it from the fire, and let it cool.—Such is the preparation of oil with which you are to grind your colours, when they are to be much exposed to the injuries of the weather, for they will resist it.

LXXII *To marble and jasper paper.*

1. Grind all the colours you want to employ (such as lake, masticot, indigo, yellow and red ochre, *&c. &c.*) with bullock's gall; grind each separately, and keep them so. Then have a large and wide pan filled with lukewarm gum water. Stir well that water with a stick. While it is in motion, and your colours being ready under your hand, with a large brush, take of each separately, as much as the tip of the brush will carry, and touch

only the surface of the water with it. The colours will immediately expand. Each colour requires a particular brush to itself. Therefore, with another brush, take of another colour, and do the same; and, with another of another, and so on, till you have put on your water all those you have destined for the purpose.

2. When the water ceases to turn, you will plainly perceive all the variety occasioned by the different colours. Then, taking your sheet of paper, lay it flat on the water, leave it there for about two or three minutes, and, without taking it out, give it one turn round on the water, then pull it by one of the edges to the side of the pan, wash it, dry it, and burnish it afterwards.

Note. The paper must be chosen good, and the water fixed with gum-adragant.

LXXIII. *To clean pictures.*

Take the picture out of its frame. Lay a clean towel on it, which for the space of ten, fourteen, or eighteen days, according as you find it necessary, you keep continually wetting, till it has entirely drawn out all the filthiness from the picture. Then, with the tip of your finger, pass some linseed oil which has been set a long while in the sun to purify it, and the picture will become as fine as new.

LXXIV. *Another for the same purpose.*

Put into two quarts of the oldest lye one quarter of a pound of Genoa soap, rasped very fine, with about a pint of spirit of wine, and boil all together on the fire. Strain it through a cloth, and let it cool. Then with a brush dipped in that composition, rub the picture all over, and let it dry. Do the same again once more, and let it dry too. When dry, dip a little cotton in oil of nut, and pass it over all the picture. Let this dry again; and, afterwards, warm a cloth, with which rub the picture well over, and it will be as fine as just out of the painter's hands.

LXXV. *A*

LXXV. *A ſecret to render old pictures as fine as new.*

Boil in a new pipkin, for the ſpace of a quarter of an hour, one quarter of a pound of gray or Briſtol aſh, and a little Genoa ſoap. Let it cool, to a lukewarm, and waſh your picture with it, then wipe it. Paſs ſome olive oil on it, and then wipe it off again. This will make it juſt as fine as new.

LXXVI. *An oil to prevent pictures from blackening. It may ſerve alſo to make cloth to carry in the pocket, againſt wet weather.*

Put ſome nut, or lintſeed oil, in a phial, and ſet in the ſun to purify it. When it has depoſited its dregs at the bottom, decant it gently into another clean phial, and ſet it again in the ſun as before. Continue ſo doing, till it drops no more *fæces* at all. And with that oil, you make the above compoſition.

LXXVII. *A waſh to clean pictures.*

Make a lye with clear water and wood aſhes; in this dip a ſponge, and rub the picture over, and it will cleanſe it perfectly—The ſame may be done with chamber-lye only; or otherwiſe, with white wine, and it will have the ſame effect.

LXXVIII. *Another way.*

Put the filings in an handkerchief, and rub the picture with it. Then paſs a coat of gum-arabic water on the picture.

LXXIX. *Another way.*

Beat the white of an egg in chamber-lye, and rub the picture with it.

LXXX. *A very curious and ſimple way of preventing flies from ſitting on pictures, or any other furniture, and making their dung there.*

Let a large bunch of leeks ſoak for five or ſix days in a pailful of water, and waſh your picture, or any other

piece of furniture, with it. The flies will never come near any thing fo wafhed. This fecret is very important and well experienced.

LXXXI. *To make indigo.*

Put fome *ifatis*, otherwife woad, or glaftum, with flacked lime, to boil together in water. There will rife a fcum, which being taken off, and mixed with a little ftarch, makes the indigo.

LXXXII. *To make a yellow.*

What the *luteola* dyes yellow, becomes green by the woad, or *glaftum*. Whence we may juftly conclude, that green is not a fimple colour, but a mixture of blue and yellow; as the yellow itfelf is a compound of red and white.

LXXXIII. *An azure of mother-of-pearl.*

Take any quantity of fuperfine teffed filver in laminas. Put it a little while in vinegar; then, take it out, ftrew over the laminas fome pounce powder to alcoholife them. Next ftratify them in a crucible; and when red hot, take them off from the fire, and you will have a fine azure.

LXXXIV. *A white for painters, which may be preferved for ever.*

Put into a large pan three quarts of linfeed oil, with an equal quantity of brandy, and four of the beft double diftilled vinegar: three dozen of eggs, new laid and whole; three or four pounds of mutton fuet, chopped fmall—Cover all with a lead plate, and lute it well. Lay this pan in the cellar for three weeks, then take fkilfully the white off, then dry it. The dofe of the compofition for ufe is fix ounces of that white to every one of bifmuth.

LXXXV. *Another white for ladies paint.*

To four parts of hog's lard add one of a kid. Melt them together, then wafh them. Re-melt and wafh them again.

again. Then add four ounces of ammoniac salt, and as much of sulphur, in subtile powder. This white will keep a long time.

LXXXVI. *A good azure.*

Take two ounces of quicksilver; sulphur and ammoniac salt, of each one ounce. Grind all together, and put it to digest in a matrass over a slow heat. Increase the fire a little; and, when you see an azured fume arising, take the matrass off from the fire. When cool, you will find in the matrass as beautiful an azure as the very ultramarine itself.

LXXXVII. *An azure from silver, done in less than a fortnight.*

Dissolve in very strong vinegar, as much gem-salt and roch-alum, as it will dissolve. Put this in a new pipkin; and over it hang up laminas of the finest tested silver. Cover the pot, and lute it well. Bury it in the cellar: and ten or fifteen days afterwards take off the azure, which you will find about the laminas. Replace things as before; and, ten days afterwards, the same again; and repeat this process as many times as you can get any azure by it.

LXXXVIII. *To make an azured water.*

1. Gather wallwort grains between green and ripe, and bake or stew them in a pan. When they have boiled a considerable time, strain them through a cloth, and keep the juice in a glass phial; its colour will never change, and will keep for ever very fine.

2. Have next dog's dung very dry. Pulverise it very fine, and sift it through a silk sieve. Then grind it on a marble with the wallwort juice, and a mullar, as painters do their colours, and you will find this paste of a very fine azure colour.

3. Now, if you tinge any water with this, by putting it in a phial to soak, you may dye whatever you will with it, such as thread, cotton, cloth, &c.

LXXXIX. *Another way of making azure.*

Take the bulk of a filbert of ammoniac ſalt, which diſſolve in a common half pint glaſs tumbler of water, Then pound and ſift, all together, one ounce of vitriol and one and a half of quick lime. Put this powder into the water in which the ammoniac ſalt was diſſolved. Leave this to infuſe for the ſpace of forty-eight hours, and at the end of that term the azure ſhall be done.

XC. *A fine azure.*

Make an incorporation of three ounces of verdigreaſe, and of an equal quantity of ammoniac ſalt, which dilute with tartar water, ſo as to make a thick paſte of it. Put this compoſition into a glaſs, and let it reſt for a few days, and you will have a fine azure.

XCI. *Another way.*

Pulveriſe and mix well together one part of ammoniac ſalt, and two of verdigreaſe, with a little ceruſe. Then pour over it oil of tartar enough to make a clear paſte of it. Put this in a glaſs veſſel, which take care to ſtop and lute well. When done, put it in an oven along with the bread, and take it out with it alſo, then the azure will be done.

XCII. *Another way.*

Take ſublimed mercury, four parts; ammoniac ſalt, two; ſulphur *vivum*, one. Pulveriſe the whole, and put the powder in a matraſs, which lute well with the lute of ſapience. Put this matraſs on a mild and ſlow fire; and, when you ſee a white fume beginning to riſe, ſtop the fire. When the matraſs is cold, break it, and you will find a very fine azure at the bottom. Now take it and work it with lukewarm water firſt, and then with cold.

Note. There are ſome who abſurdly waſh it with lye, or a ſtrong lime-water; but they ſpoil their azure entirely. —What is moſt adviſeable, and indeed the only preparation allowable, is to boil a little white honey in the water, and

and ſkim it; and when that water becomes lukewarm, waſh the azure with it. This may contribute to give it a fine colour, but the other will certainly hurt it.

XCIII. *To make an admirable white lead, fit for oil painting and colouring of prints.*

Grind the fineſt white lead in flake you can find, on the ſtone with vinegar. It will immediately turn black.—Waſh it well in a panful of water, and let it ſettle. Pour the water off by inclination, and grind it again with freſh vinegar, then waſh it a-new. Repeat this operation four or five times, and you will get a moſt beautiful white.

XCIV. *The preparation of verdigreaſe.*

Grind the verdigreaſe with vinegar, and put it in a piece of brown bread dough. Bake it as you would bread; and when done, cut it open and take it out. You will then have a very fine verdigreaſe, fit to work with, either in oil or water, as you like.

XCV. *A fine liquid green.*

Mix well together, one pound of Montpelier verdigreaſe, and half a pound of white tartar from the ſame place. Put this a-ſoaking for twelve hours in two quarts of the ſtrongeſt vinegar, then reduce it by boiling to one half. Let it reſt for two days, and filter it afterwards in a bottle, wherein you will keep it for uſe.

XCVI. *To make the* Stil-de-grain, *or* Brown pink.

Bruiſe and boil in three quarts of water, four ounces of French berries, to the reduction of one half. Strain all through a cloth, and put in this juice a diſcretionable quantity of whitening, pounded and ſifted into a ſubtile powder, ſo as to make a thick paſte, which put into ſmall tied bags, and ſet to dry on tiles. When dry, it is uſed with gum. And to render it finer, you may put ſome gamboge.

XCVII. *To make a fine vermilion.*

Make a mixture of cochineal powder and burnt alum. Stifle it quite hot in roſe or plantain water. It will give you the fineſt vermilion in the world.

XCVIII. *A ſecret to draw without either ink or pencil.*

Rub a ſheet of paper with tripoly. Then, with any blunt point, form your drawing on it. Whatever you trace will be viſible.

XCIX. *To make an imitation of enamel on tin, for chimney-branches,* &c.

Get a ſheet of black-tin very clean, and cut it in the form, ſhape, and figure you chuſe to make your flowers and other things. Grind what colours you propoſe to make uſe of, with clean water, and each ſeparately, then let them dry. When you want to employ them, dilute them, each apart, with liquid varniſh, and lay them on with the bruſh. Set the work in the open air for fear the colours ſhould run, and when they are a little thickened and conſolidated, finiſh drying them before a gentle fire.

C. *A valuable ſecret to make exceeding good crayons, as hard as red chalk, diſcovered by Prince* Rupert, *brother to Prince* Palatin.

Grind on the ſtone, ſome tobacco-pipe clay, with common water, ſo as to make a paſte of it. Then take ſeparately each colour, and grind them, when dry, on the ſtone, ſo fine as to ſift them through a ſilk ſieve. Mix, of each of the colours, with your firſt white paſte, as much as will make it of a higher or paler hue, and embody the whole with a little common honey and gum-arabic water.

Note. You muſt be attentive to make crayons of various degrees of hues in each colour, for the *chiaros* and *oſcuros*, or lights and ſhades. Then roll each crayon between two boards very clean, and ſet them to dry on paper for two days in the ſhade. To complete their drying, lay them in the ſun; and then you may uſe them with ſatisfaction.

CI. *To*

CI. *To render the ſtone-cinnabar and vermilion finer; and, at the ſame time, to prevent them from blackening.*

1. You raiſe the hue of the ſtone vermilion, if, in grinding it, you add gamboge water, tinged with a little ſaffron. This preparation extends only to the red.

2. With reſpect to the orange colour, you muſt add ſome minium to it.

3. For the yellow, put a diſcretionable quantity of orpine in cakes, prepared as follows—Take the fineſt orpine you can find, and grind it well with water. Make it in little cakes, and ſet it to dry on paper. When dry, pulveriſe and uſe it.

4. For the *gridelin*, take French ſorrel and boil it in water, to draw as ſtrong a tincture from it as you poſſibly can. Then have white lead, (dried in cakes, and prepared after the method abovementioned for the orpine) and grind it anew with this ſorrel tincture, then dry it. Grind and dry it again, and repeat this operation with the ſorrel tincture, till you have obtained the deſired point of colour.

CII. *Proceſs uſed in making Eaſtern carmine.*

1. Have a two quart glazed pipkin, quite new, Waſh it with boiling water, then fill it with water, very clean and filtered. Set it on blaſting coals, and when it begins to boil, throw in a drachm of *chouan* in fine powder, which boil very quick for near a quarter of an hour. Then ſtrain this water through a cloth waſhed in lye, but not with ſoap, and receive it in another new glazed pipkin, waſhed as the firſt. Put this on a fire, not quite ſo blaſting as the firſt; and, when it begins to give ſigns of boiling, throw in one ounce of the fineſt cochineal, pulveriſed very fine. Stir often with a hazel ſtick, ſtripped of its peel, and let boil gently for near a quarter of an hour; then throw in ſixty grains of *autour* in ſubtile powder, and keep it boiling for half a quarter of an hour. Take it off from the fire, and throw in ſixteen grains of Roman alum in powder, then ſtrain it immediately through a clean cloth, waſhed with lye, and no ſoap, and receive it in two dif-

ferent large china bowls, new and perfectly clean. Place theſe in a room, where they will be perfectly free from duſt, and let them reſt there for a week, that the carmine may have time to make a precipitation.

2. At the end of this term, decant out gently your tincture into two other China bowls, of the ſame ſize as the two former, and as perfectly clean, taking great care in decanting, to do it ſo gently that the liquor may not carry the carmine along with it. Then dry in a ſhade the carmine, which is left in the bottom of your bowls, gather it with a little bruſh, and keep it very cleanly.

3. Eight or ten days afterwards, more or leſs, decant again the tincture which is in the ſecond bowl into a new varniſhed pipkin, then dry and gather the carmine, which is at the bottom, in the ſame manner as the firſt.

4. Then ſet the pipkin, in which the carmine has been decanted for this ſecond time, on the fire, and vaporiſe the liquor gently, till the ground remains in the conſiſtence of a pap. This pap-like ground muſt then be put into ſeveral ſmall china cups, and placed in the ſun to dry, which will procure you again another carmine, darker and much leſs valuable than the firſt. Should there happen any moiſtneſs on your laſt cups, take it off immediately, but gently, and with a great deal of care.

5. In order to take the water off from your china bowls, you might make uſe of another method, *viz.* a very fine and clean ſponge, in the following manner. Dip your ſponge into very clear and pure water, and there work it well with your hand, ſoaking and preſſing it alternately, till you have rendered it very ſoft. Then preſs and ſqueeze it dry in a clean towel. Now, if you only approach it to the ſuperfice of the tinctured water, it will immediately fill itſelf with it, and you may ſqueeze it into another empty bowl, thus repeating the ſame proceſs, till you have got it all out of the firſt bowls; taking care every time you approach it to the ſurface of the water, leſt it ſhould touch the carmine; for no doubt but it would carry ſome along with the water.

6. If you diſſolve one drachm of mineral cryſtal into this tincture, by boiling it to that effect for five or ſix minutes,

minutes, it will help a great deal the precipitation of the colour, from which you take out afterwards the water with a ſponge, as we ſaid before. Should the water you have thus drawn out be ſtill tinged, you may add ſome more mineral cryſtal to it again; boil it as before, ſtrain it through a cloth, and let it ſettle. By theſe means you will have very fine crimſon carmine.

CIII. *The proceſs obſerved in making the lake.*

1. Take one pound of Alicant kali, or Bril-aſh, pulveriſed, which put in a kettle with four quarts of ſpring water. Boil the whole for the ſpace of a quarter of an hour, keeping ſtirring all the while with a ſtick, then take it from the fire, and let it cool, ſo as to be able to keep your finger in it without ſcalding. When it is in that ſtate, throw it in a jelly-bag, made of cloth, to filter it, and render it perfectly clear. Put it, next, in a new glazed pipkin, with one ounce of finely pulveriſed cochineal, previouſly diluted by degrees with ſome of the ſame lye. Set it a-boiling for half a quarter of an hour, and never ceaſe to ſtir it with a ſtick all the while it is on the fire—You may, if you chuſe, add one drachm of *ſerra merita* in fine powder, at the ſame time with that of the cochineal; it will render your lake the redder—When the whole ſhall have boiled the preſcribed time, take it off the fire, and let the tincture cool, in order to paſs it through a cloth, or the above-mentioned jelly bag. Set a large ſtone pan under the bag to receive the tincture which ſhall filter; and, when all is well drained, take the bag, turn it to throw off all the dregs, and waſh it well, inſide and outſide, in clear water, and wring it quite dry.

2. Now hang again this ſame bag at two feet diſtance, or thereabouts, above the pan wherein the tincture did run, and now is. Diſſolve, in about two quarts of warm ſpring water, ſix ounces of Roman alum well pounded, that it may more readily melt. When this diſſolution is no more than lukewarm, have ſomebody to pour it for you in the above jelly-bag, while you ſtir with a ſtick what runs from it into your tincture, and do ſo till the

whole is paſſed through, and the tincture froths no more. —Then wring well your bag again, to expreſs all the alum's diſſolution from it into your tincture, and waſh it again afterwards in clear water, as before.

3. Have another ſtone pan like the firſt, hang your bag again over it, and pour all your tincture in it. If it run clear like water, you may then let it go ſo; if not, put it again in the bag over the other, and continue ſo to do till it abſolutely does run clear. If, however, after having repeated this three or four times, it ſhould continue to run tinged, diſſolve two or three ounces more of pulveriſed Roman alum in about two quarts of that tinged water, then ſtir and mix it well in the whole quantity of tincture, then pour it again in the bag where the lake is, re-pouring again and again what ſhall run firſt from it, till it runs quite clear, and does not even ſtain the paper.

4. Then let drain well the lake which is in the bag; and, with a box-ſpoon take it, and ſpread it on pieces of cloth, laid on plaiſtered ſtones, and let it dry in the ſhade where there is no duſt, or where, at leaſt, you may preſerve it from any.

CIV. *To make the fine columbine lake.*

1. Take half-a-pound of the fineſt Braſil wood you can find. Cut it in ſmall bits, and pound it in an iron mortar. Put this in a new glazed pipkin; pour over it two quarts of ſtrong wine vinegar. Let this infuſe without the aſſiſtance of any heat for three whole days. Boil it next for half an hour, then add one ounce of pulveriſed Roman alum, and boil it again for the ſpace of three quarters of an hour, that the alum may the more perfectly be diſſolved, and the ſtronger the colour.

2. Take the pot off the fire; and raſping the ſofteſt part of a dozen cuttle-fiſh bones, add this powder to it. Replace the pot on the fire, and ſtir the contents till you ſee a froth riſing on the compoſition; when immediately taking the pot off from the fire again, cover with its lid, and let it ſtand for a week. During that ſpace of time you muſt, however, carefully ſtir this matter four times a day.

3. Have

3. Have next a glazed pan, filled with dry ſand as high as three fingers from the brim. In this ſand put your pot half way in. Place all on a charcoal fire, till it nearly boils; then, taking the pot off from the fire, run the liquor through a clean cloth. Put it in different retorts, and ſet them half way in the ſand again, which, by this time, ought to be quite cold. Replace all on the fire as before, and keep it there till it begins to ſimmer; then, taking it from the fire, let it cool, and the lake is done. But it muſt not be uſed till twelve days after.

Note. When the tincture is in the retorts, you may put in each of them half a gill of lye, made with vine branch aſhes.—When you put the powder of cuttle-fiſh bones in the tincture, you muſt take care it is warm.—The reſidue which is found at the bottom of the retorts ought not to be thrown away, as it is very good to paint in water colours.

CV. *A fine red water, for miniature painting.*

1. Put in a new glazed pipkin one ounce of *Fernamburg Braſil* wood, finely raſped. Pour three pints of ſpring water on it, with ſix drachms of fine white iſinglaſs chopped very ſmall. Place the pot on warm aſhes, for three days, during which you are to keep up the ſame degree of heat.

2. When the iſinglaſs is melted, add two ounces of kermes in grain, one of alum, and three drachms of borax, well pounded. Boil this gently to the reduction of one half; then ſtrain the liquor through a cloth, bottle and ſtop it well, and ſet it in the ſun for a week before uſing.

Note. This water may very properly be uſed as a waſh to give an agreeable bloom to pale faces.

CVI. *The receipt of the fine* Venetian *lake.*

1. Take one pound of good pearl aſhes. Put it in a large copper; then, pour over it ſix gallons of ſpring water. Let the pearl aſhes ſoak thus twenty-four hours, after which, ſet the copper on the fire, and boil it for one quarter

quarter of an hour. Then filter through a cloth jelly-bag, and receive the filtration in a ſtone pan.

2. If not quite clear, filter it till it is; changing the pan only underneath, pour what ran thick in the bag again. When all is new filtered and clear, put it in the copper again, which muſt have been previouſly waſhed, and ſet it on the fire to boil. When it boils, throw in two pounds of fine ſcarlet flocks, which boil to whiteneſs. Then filter again this lye tinged with ſcarlet colour, in the beforementioned jelly-bag, and preſs well the flocks, that there may not remain any colour in them.

Obſerve that your bag may ſerve both for the lake and tincture, without being at the trouble of cleanſing it, you muſt not filter through it the ſecond lye in which the ſcarlet is. For ſhould you pour this lye from the copper, directly into it, the ſcarlet flocks would undoubtedly run with the lye, which would give you an infinite deal of trouble to get out of the bag, after the filtering of the tincture. And the leaſt bit of it would entirely ſpoil the lake. Therefore, to avoid all theſe inconveniences, ſtrain your ſecond lye either through a cloth, or through another bag by itſelf.

3. While the tincture is filtering, get the copper well cleaned, and wiped dry. Put the filtered tincture in it. Diſſolve, over the fire, or glazed earthen pan, half-a-pound of Roman alum in one quart of ſpring water. Then ſtrain it quickly, and while warm, pour it in your tincture, keeping ſtirring all the while, and afterwards, till all the froth has quite ſubſided. Boil next altogether, for the ſpace of half a quarter of an hour. Then throw it in the ſame bag that filtered your firſt lye, and receive the filtration into a clean ſtone pan.

4. Beſides this: boil again, in another quart of ſpring water, half a pound of *Fernamburg Braſil* wood, cut and bruiſed in an iron mortar. Strain it through a cloth, and pour it, along with the above diſſolution of Roman alum, in the jelly-bag, and ſtir it to run altogether.

5. After all is run out of the bag, throw in again half a pint of quite clear and pure ſpring-water.

6. When nothing runs any more out of the bag, the lake is left in it. Take it out with a box ſpoon, and ſpread

ſpread it on plaiſter flat ſtones, three fingers thick, and about half a foot ſquare, covered with white cloth of the ſame ſize. For ſhould there be no cloth on the plaiſter, the lake would ſtick to it.

Note. It often happens for the firſt water which runs out of the bag to be muddy, and to carry ſome lake along with it. But you muſt continue filtering till it comes bright and clear. Then, taking off the pan from underneath, and ſubſtituting another, put that muddy liquor into the bag again.—Should the filtration by chance continue to run red, as it ſometimes happens, you muſt ſtill keep filtering the liquor through the bag, till it is clarified.

CVII. *Directions for colouring prints.*

1. All the colours which are uſed for colouring prints are grinded with gum water; the calcined green only excepted, which grinds with vinegar.

2. The chief of theſe colours are, fine azure, vermilion, Venetian lake, fine verditure, white lead, calcined green, umber, Cologn earth, indigo, French berries juice, yellow ochre, yellow maſſicot, white maſſicot, brown ochre, biſtre, or prepared ſoot, lamp-black, and brown red.

3. For complexions, make a mixture of white and vermilion, more or leſs, according as you want the colour. For the lips, it is a mixture of lake and vermilion, And the ſhades are made with white and vermilion, and a great deal of umber.

4. For fair hair, join a good deal of white with very little umber. If a carrotty colour, take yellow ochre and brown red; the ſhade with biſtre and lake mixed together. If light, only mix ſome black and white and umber together.

5. Clothes are made, if linen, with white lead and a little blue; if ſtuffs, with white lead alone, and the ſhades with a grey colour, made by means of a mixture of black and white lead together. If a white cloth, you muſt make a mixture of white and umber together, and ſhade it with a compound of umber and black. If a red cloth, uſe vermilion in the lighter parts of the folds; lake and

and vermilion for the clear ſhades; the lake alone, laid on the vermilion, will form the dark ſhades.

CVIII. *Directions for the mixture of colours.*

1. The pale yellow, for the lights, is made with white maſſicot. The *chiaro oſcuro*, with the maſſicot and umber. The dark ſhade, with umber alone.

2. The orange colour is made with black lead for the lights, ſhade with the lake.

3. The lake is uſed very clear for the lights, in draperies; and thicker for the ſhades.

4. The purple is made with blue, white, and lake, for the lights; blue and lake only for the clear ſhades, and indigo and blue for the darker ones.

5. The pale blue is uſed for the lights, and for the clear ſhades a little thicker; but for the darker ſhades, mix the indigo and blue together.

6. The gold-like yellow is made with yellow maſſicot for the lights; and the clear ſhades with a mixture of black lead and maſſicot; the darker ſhade with lake, yellow ochre, and very little black lead; and the darker of all, with Cologn earth and lake.

7. The green is of two ſorts. The firſt made with maſſicot and blue, or blue and white; and for the ſhades, make the blue predominate in the mixture. The other is made with calcined green; and French berries juice, mixed and calcined green; and you may form their ſhades by addition of indigo.

8. For trees you mix green and umber together.

9. The grounds are made in the ſame way; wherever there is any green, take calcined green, with French berries juice.

10. For the diſtances, mix green and blue together; and mountains are always made with blue.

11. The ſkies are likewiſe made with blue, but you muſt add a little yellow to them, when it comes near the mountains; and to make the tranſition between that and the blue, mix a little lake and blue together to ſoften it.

12. Clouds are made with purple; if they be obſcure, you muſt mix lake and indigo together.

13. Stones

13. Stones are made with white and yellow mixed together: and their ſhades with black.

CIX. *Directions for painting* freſco.

Lay on the intended wall a coat of rifted ſilver ſand, mixed with old ſlacked lime, pulveriſed and ſifted alſo—This coat is not to be laid on the wall, but in proportion as you paint: therefore prepare no more at a time than you are ſure to paint over in one day, while freſh and moiſt.—The body of the wall on which you lay this coat muſt previouſly be pargetted with plaiſter, or mortar made with ſand and lime. And if the paintings are to be expoſed to the injuries of the weather, the maſon's work muſt be made of bricks or free-ſtones very dry.

2. Before you begin to paint, you muſt prepare your deſigns in their full intended ſize on paper, and chalk them one after another on the wall, in proportion as you work, and no longer than half an hour after the coat of prepared river ſand has been laid on, and well poliſhed with a trowel.

3. In theſe ſorts of paintings all the compounded and artificial made colours, as well as moſt of the mineral ones, are rejected. They uſe hardly any other but earths, which may preſerve their hue, and defend it from being burnt by the lime. And that the work may for ever preſerve its beauty, you muſt obſerve to employ them quickly, while the coat underneath is ſtill moiſt; and never, as ſome do, touch them over after they are once dry, with colours diluted in yolks of eggs, glue, or gum, becauſe theſe colours always blacken, and never keep that vivacity and brilliancy thoſe have which have been laid at firſt when the ground was moiſt. In the caſe of paintings expoſed in the air, this ſort of *touching up* is never good, and too often ſcales off in a ſhort time.

CX. *Directions for the choice, uſe, and compoſition of the colours employed for the above purpoſe.*

The colours made uſe of for the above purpoſe, are ſuch as follow.

1. The

1. The white is made with a lime which has been ſlacked for a great while, and white marble in ſubtile powder, mixed in about equal quantities. Sometimes no more than a quarter part of marble duſt is required; which depends entirely on the quality of the lime, and cannot be known but when you come to uſe it; for if there be too much marble, the white will turn black.

2. Ochre, or brown red, is a natural earth.

3. Yellow ochre is alſo a natural earth, which becomes red if you burn it.

4. The obſcure yellow, or yellow ochre, which is alſo a natural earth, and ſlimy, is to be got by the ſtreams of iron mines. It receives a fine colour from calcination.

5. Naples yellow, is a ſort of filth which gathers round the mines of brimſtone; and though it be uſed in *freſco* paintings, its colour nevertheleſs, is not ſo good as that which is made of earth, or yellow ochre and white mixed together.

6. The purple red is a natural earth, the product of England, and is uſed inſtead of lake.

7. The *terverte*, from Verona in Lombardy, is a natural earth, which is very hard and dark. There is alſo another ſort of *terverte*.

8. The ultramarine, or *lapis lazuli*, is a hard ſtone, and of a very difficult preparation. This colour, of the manner of preparing which we ſhall give (§ ix. Art. cxxviii.) a juſt and preciſe account, ſubſiſts and keeps itſelf fine much longer than any other colour. It is not to be ground, but diluted only on the pallet with oil. As it is very dear, you may ſpare uſing it in *freſco* paintings, and ſupply it by ſmalt, which anſwers the ſame purpoſe, particularly in ſkies.

9. Smalt is a blue colour, which has very little ſubſtance. It is uſed in great landſcapes, and ſtands very well the open air.

10. Umber is an obſcure earth. It requires to be calcined in an iron box, if you want to make it finer, browner, and of a better look.

11. Cologn earth is a ſort of ruſty black, which is apt to diſcharge, and turn red.

12. The

12. The earthen black, is a black which comes from Germany—There is alſo another ſort of German black, which is a natural earth, and makes a bluiſh black, like that of charcoal. This ſort of black is that which is uſed for making printers ink.—There is another ſtill, which is made with burnt wine-lye.

Such are all the colours which are preferably to be uſed in *freſco*-painting. Grind and dilute them with water.—Before beginning to work, prepare your principal colours, and put each by themſelves, in ſmall gallipots. But it is neceſſary to know, that except the purple-red, the brown-red, the yellow ochre, and all the blacks, (thoſe particularly which have paſſed through the fire) turn paler as the *freſco* dries.

CXI. *Directions for painting in oil on a wall. Method* 1.

You muſt, when the wall is perfectly dry, give it two or three coats of boiling oil, or more, if neceſſary, ſo that the face of the wall may remain greaſy, and can ſoak in no more; then lay another coat of ſiccative colours, which is done as follows. Grind ſome common whitening, or chalk, red ochre, and other ſorts of earth, pretty ſtiff, and lay a coat of it on the wall. When this is very dry, then draw and paint on it whatever you will, obſerving to mix a little varniſh among your colours, that you may not be obliged to varniſh them afterwards.

CXII. *Method* 2.

In order it may ſooner dry, and that the dampneſs ſhould not occaſion the colour to ſcale, as it ſometimes happens, on account of the oil which reſiſts it, make a cement with lime and marble duſt, or tiles; this lay on the wall with a trowel, ſmoothen it, and then give it a coat of lintſeed oil with a large bruſh.—In the next place, prepare a compoſition of Greek pitch, maſtich, and coarſe varniſh, which boil altogether in a pipkin, and lay afterwards, firſt with a bruſh, then ſmoothen with a hot trowel, in order to ſpread it more equally.—

When

When this is done, lay on the coat of ficcative colours abovementioned, then draw their design and paint.

CXIII. *Method 3.*

Others again make a cement, or mortar, with lime, brick-duft, and fand. And when this is dry, make another with lime, fifted brick-duft, and fmith's embers, or iron fcum, all in equal quantities. Beat and incorporate together, with whites of eggs and lintfeed oil, and it will make fo ftrong a cement as cannot be equalled by any thing elfe. Its nature is fuch, that while you are laying it on, you muft not ftop and leave it till you have finifhed, otherwife it will affuredly crack in every one of thofe places where you refumed your work. Therefore go on without interruption, till the whole wall is entirely covered with it, and totally polifhed—And when dry, lay the abovementioned coat of ficcative colours, and proceed according to the other directions.

CXIV. *Directions for painting in oil on wood.*

Lay firft one coat of fize on the wood; then another of whitening diluted with fize; then another again of boiling oil, as mentioned in the above Art. cxi. When this laft is thoroughly dry, you draw your defign, and paint as ufual.

CXV. *Directions for painting in oil on canvaf.*

1. Chufe a fine and fmooth tick or cloth, which nail on a frame. Pafs over it firft a coat of fize, and when dry, rub it over with a pounce ftone to eat off all the knobs and knots. The fize which you put firft on the cloth is intended to lay down all the threads, and fill up all the fmall holes, that the colour may not pafs through.

2. When the cloth is dry, lay on a coat of fimple colour, which may not deftroy the others; for example, brown-red, which is a natural earth, full of fubftance, and lafting. You may mix it, if you like, with a little white lead, it will dry the fooner.—To grind this colour,

lour, they uſe nut, or lintſeed oil; and in order to lay it as thin as it is poſſible, they uſe a large knife made on purpoſe.

3. When this colour is dry, you are to rub it again with the pounce ſtone, to render it ſmoother. Then lay another coat of white lead and charcoal black, to render the ground greyiſh. In this as well as in the preceding coats, you muſt take care to put as little colour as you poſſibly can, to prevent the cloth from cracking, and for the better preſervation of the colours which are to be laid afterwards in painting. For it is proper to obſerve, that could there be no ground at all laid on the canvaſs of a picture, previous to the painting of it, and ſhould one paint directly on the bare cloth, without any other preparation at all, the colours would appear much more to their advantage, and preſerve their brightneſs much longer. A proof of this aſſertion may be found in the practice of *Paul Veroneſe*, and *Titian*, who uſed to impregnate their canvaſs with water colours only, and paint afterwards in oil over that ground. This cuſtom of theirs has not a little contributed to render their pieces more lively and bright, becauſe the ground in water colour draws and ſoaks the oil off the colours, which muſt render them much finer, ſince the greateſt cauſe of their dulneſs ariſes from nothing but the oil with which they are diluted.

4. They therefore, who wiſh to ſee their works keep bright and lively, uſe as little oil as poſſible, and keep their colours more ſtiff, mixing a little oil of ſpike amongſt them, which indeed vaporiſes very ſoon, but aſſiſts in rendering them more fluid and tractable in working.

5. Another cauſe of the colours not keeping a long while their beauty, is when they are too much tormented on the paſter, as it often happens that painters confuſe them in working. Whenever this is the caſe, they muſt needs be hurt, as there are many which adulterate, and otherwiſe corrupt the others, and ſpoil the vivacity of their teint. Therefore, we cannot recommend too much to be cautious and clean in employing them, taking care

to

to lay them as distinct and separate as possible, each by themselves, on the pallet, without mixing them too much with the brush or pencil. Never mingle together those colours which are enemies to each other, as all the blacks are, particularly the lamp-black; but as much as possible, try to use them separately by themselves. Nay, when there is an occasion of giving more strength to some parts of a picture, stay till it is dry before you touch it up again, if those colours are obnoxious to the others with which you are to do it. There he shows his judgment in painting, who is not precipitate in laying his colours on his pictures, but lays them thick enough, and covers at several times the carnations, which in terms of art is called *empater*.

6. As to what concerns the first laying of grounds on canvass, in water colours, it is a method not commonly practised, because they may scale, and cannot be rolled without some difficulty. For this reason, the custom prevails of grounding the canvass with oil colours. But when the canvass is good and very fine, the less colour you can lay on for that purpose, the better. Take care only those colours and oils are good.—The lead which some painters use to help their colours to dry the sooner, soon destroys their brightness and beauty.

CXVI. *Which colours are used for the above purpose.*

1. Though all the different sorts of colours which are used in painting in oil are not fit for that called *fresco*, yet it is true, however, that (except lime and marble dust, which indeed cannot strictly be called colours) every one of those used in *fresco* are good in oil.

2. White lead; is made with lead which you bury. Several years after, this lead turns into some sorts of flakes, which are of a very fine white.—Though this white exists in painting, and is in positive use, it has always, however, a very bad quality, which the oil corrects a little, when you grind it on the stone.

3. Ceruse, or flake white; is a sort of rust gathered from lead, but of a coarser nature than the other.

4. Massicot;

4. Maſſicot; there are two ſorts of this colour. The one is yellow, and the other is white. It is made with calcined lead.

5. Orpine, otherwiſe auripigment. Is uſed calcined and non-calcined.—To calcine it, they put it in an iron box, or in a pot well ſtopped. But few either calcine it, or even uſe it at all, as the fumes are mortal, and it is very dangerous to uſe it.

6. Black lead comes from lead mines. They make very little uſe of it, becauſe it is a bad colour of itſelf, beſides that, it is a great enemy to the others.

7. Cinnabar, or vermilion, is drawn from the mines where they gather quickſilver. As it is a mineral, it is the reaſon why it does not reſiſt the impreſſion of the air, nor the injuries of the weather.

8. Lake. This colour, which is an artificial made one, is compoſed with cochineal, or with ſcarlet flocks; or again, Braſil wood, and ſome other ſorts of woods. There are ſeveral ſorts of lake made. It does not ſtand the weather.

9. Blue verditure and green verditure is very ſeldom uſed in any other works but landſcapes.

10. Indigo. This colour is generally uſed for making ſkies, or draperies; when properly uſed, it keeps its beauty a great while. You muſt not mix it with too great a quantity of oil, but lay it a little thick and dark, becauſe it diſcharges very much. They uſe it with great ſucceſs, diluted with gum water. It is a good colour for the compoſition of greens.

11. Brown-pink, otherwiſe called *ſtil-de-grain*. This colour is drawn from what is called French berries, which they ſoak and boil, then mix the reſult with vine-wood aſhes, or calcined white chalk, to give it a proper conſiſtence. When this is done, it muſt be ſtrained through a very fine cloth.

12. Lamp-black. This is a bad colour, but handy to paint black draperies.

13. Ivory black. This black is made indifferently with common bones, as well as ivory burnt. *Appelles* diſcovered

discovered this sort of black, if we believe *Pliny*, Book xxxv. Chap. v.

14. Verdigrease is the most pernicious of all the colours, and capable to ruin a whole picture, if there were never so little in the colour with which the canvas is first impregnated. It is however of a very agreeable look. They sometimes calcine it to prevent its malignant effect; but it is as dangerous to use it that way as orpine; and it is an undoubted truth that, however well prepared it may be, it must be employed by itself, for it would spoil all the colours with which it may be mixed. It dries very much, and for that purpose they mix a little of it with the blacks, which can never dry without some assistance.

N. B. You must be very careful never to use, for other colours, the pencils with which you shall have laid any verdigrease.

15. There are again some other sorts of compound colours, which are never used but in oil.

CXVII. *Which oils are used in painting.*

1. The best oils which are used in painting are those of nut and lintseed. To render the colours more fluid, and spread more easily under the pencil, they use also oil of spike. This oil absorbs itself in the canvas, and leaves the colours without any gloss. It is made with the flowers of a plant called spikenard or lavender spike.

2. There is another oil drawn from Melezian-rosin, firs, *&c.* wherefore it is called oil of turpentine. This oil is very good for touching up pictures; but it is chiefly good for mixing with ultramarine, and the different sorts of smalts, because it serves to make them spread with more facility, and evaporates almost immediately. When you make use of this oil, the less there is of any other oil in the colour the better, as they all serve only to make it turn yellow.

3. There are other oils again which are denominated siccative oils, because they serve to dry up the others the sooner. These are many in number and species. One sort is nothing but the oil of nut, boiled with gold litharge

litharge and a whole onion peeled, which is taken off after boiling; this onion ſerving only to exſiccate the greaſy parts of the oil, and to clarify it. Another ſort is made with azure in powder, or ſmalt, boiled in oil of nut. When the whole has boiled, you muſt let it ſettle, and then ſkim off the top. It is fitteſt for diluting the white, and ſuch of the other colours as you want to preſerve pureſt and neateſt.

CXVIII. *To take off inſtantly a copy from a print, or a picture.*

Make a water of ſoap and alum, with which wet a cloth or a paper; lay either on a print or picture, and paſs it once under the rolling-preſs; then going round the other ſide to take it up, you will have a very fine copy of whatever you ſhall have laid it upon.

CXIX. *Directions for making the Spaniſh carnation.*

Take baſtard ſaffron; waſh, dry, and grind it well. While you grind it, put in four ounces of pearl aſhes to every one pound of ſaffron. Incorporate them well, both together, and throw it into a double cloth jelly-bag. Then ſet half a pint of Spaniſh lemon juice on the fire, and when juſt lukewarm, pour it on the ſaffron in the bag, and lay under it what you want to dye.—The ſtuff which is to be dyed ought previouſly to have been boiled in alum-water, then rinſed and wiped between two cloths, as a preparatory proceſs to make it take the dye better.

CXX. *To make the Spaniſh ladies* rouge.

Vermilion, carefully laid on a ſheet of paper, from which, by means of wetting the tip of your finger with your ſpittle, then take it off, at will, and rub your cheeks, lips, &c. The method of making it is as follows.

1. Take good ſcarlet flocks and ſpirit of wine, or in their ſtead, lemon juice. Boil the whole in an earthen pot, well glazed and well ſtopped, till the ſpirit of wine, or lemon juice, has charged itſelf with all the colour of the ſcarlet flocks. Strain this dye through a cloth, and

wring it hard to express well all the colour out. Boil it afterwards with a little arabic water, till the colour becomes very deep.

2. On half a pound of scarlet flocks you must put four ounces of spirit of wine, and a sufficient quantity of water, to soak well the flocks. Then in the colour you extract from it, put the bulk of a filbert of gum arabic, and boil the whole in a silver poringer. When this is ready, as we said before; proceed as follows.

3. Steep some cotton in the colour, and wet some sheets of paper with it; then let them dry in the shade. Repeat this wetting, drying of the same sheets over again, many times, till you find they are charged with *rouge* to your satisfaction.

CXXI. *A fine lake, make with shell-lac.*

1. Boil and skim well, sixteen pounds of chamber lye; then put in one pound of fine shell-lac, with five ounces of roch alum, in powder. Boil altogether, till you see the chamber-lye is well charged with the colour, which you may easily know by steeping a bit of white rag in it; then take it out again to see whether or not the colour please you; and if it do not, let it boil longer, repeating the same trial, till you are perfectly satisfied.

2. Throw now the liquor in a flannel bag; and without suffering what runs into the pan under to settle, repour it into the bag so many times, till the liquor runs at last quite clear, and not tinged. Then with a wooden spatula, take off the lake, which is in form of curd; form it into small cakes, or balls, and dry them in a shade on new tiles; then keep them for use.

CXXII. *Directions to make cinnabar, or vermilion:*

1. Put mercury (or quicksilver) in a glazed dish. Set it on a sand-bath, and let it be well surrounded with the sand every way. Pour some melted brimstone over it; and with an iron spatula, keep constantly stirring, till the whole is converted into a black powder.

2. With this powder, fill the quarter part of a retort with a short and wide neck. Place it first on a fire of cinders.

cinders. Increaſe the fire by degrees, and continue it for ten hours; after which make a blaſting one for twelve hours.

3. Obſervations.—By the firſt fire, there will ariſe a black ſume.—By the ſecond, a yellow.—And by the laſt a red; which ſignifies the perfect accompliſhment of the cinnabar.—As ſoon as this is the caſe, let the veſſel cool, and you will find in the receiver, and in the neck of the retort, a very fine cinnabar.

N. B. Many, inſtead of a glaſs retort, uſe earthen, or ſtone, which all equally bear the fire. Make a ſlow fire, for about half an hour, then increaſe it till the red fumes ariſe. Both methods anſwer the ſame purpoſe.

CXXIII. *Another method of making cinnabar.*

1. Melt brimſtone in a pipkin over a ſlow fire, then take it out, and with one hand ſqueeze a knot of mercury between your fingers through a cloth into the melted ſulphur; and with the other, ſtir well till the lump is become quite cold and black.

2. Put this into a ſubtile powder, with which having filled the fourth part of a very long retort, lute it well, and very exactly, with a good lute. Place it next without a receiver, for two or three hours, on a very mild fire; then introduce into the retort a long funnel which will reach to the bottom of the retort, through that funnel paſs a long ſpatula, which touching alſo the bottom of the retort, ſhould come out of the funnel five or ſix inches. In the middle of the ſpatula let there be a bung of lute round it, well dried, which will ſtop ſo well the retort as to prevent it from breathing any air. When all this is done, puſh on the fire to a pretty ſmart degree, and keep it for five hours.

3. At the end of this term, draw out the ſpatula, and introduce, through the ſame way that it came out, two ſpoonfuls, or thereabouts, of your prepared powder of brimſtone and quickſilver, with which you intend to make cinnabar, which for that purpoſe, have kept warm in a veſſel by the corner of the fire, that it may not cool the retort in going in, and thereby retard the operation.

4. Continue so to do, adding every hour new matter, by means of the drawing out the spatula to introduce the new powder, and replacing it quickly, till you have increased your lump of cinnabar to the quantity of one hundred weight.—The spatula's use in the neck of the retort is to prevent its filling itself up by the sublimation of the matter, which would occasion two evils, that of breaking of the retort, and of preventing the introduction of new powder to increase the lump of cinnabar. So that at the same time it keeps a free passage into the retort, it nevertheless stops it too, by means of the ball of lute which is round it—But in the last place, in order there should remain no vacancy in the middle of the cinnabar-lump, take off the spatula for the last time, and inject fresh powder; then, without reintroducing the spatula, stop the retort with a lump of lute only—Thus the longer you keep the fire up, the harder and redder the lump of cinnabar becomes.

5. Observations.—This cinnabar is the very same which empyrics use in fumigation, along with aloes wood, myrrh and other aromatics, to excite the mouth, or belly, flux, which they reiterate two or three times, or till that flux is abundant enough to procure the cure of the venereal disorder—It is the same also which painters make use of; and which enters into the composition of sealing wax.

Some alchymists maintain, they can with the natural or fictitious cinnabar we have just mentioned, resolve irreductibly either gold or silver; because they are of opinion, that these metals have sprung from it in the entrails of the earth. But it is proper to tell them here, that they would not perhaps commit so gross an error, if they attempted this process with the cinnabar, which the philosopher endeavours to draw from quick gold and silver, and which are known to him alone. To which reflection I shall add, that he to whom quick gold and silver are known can do with them also every thing as with the metals; but as the old saying is, *Non licet omnibus adire Chorintam.*

CXXIV. *An*

CXXIV. *An azure as fine as, and which looks similar to, ultramarine.*

Grind well together into powder three ounces of ammoniac salt, and six of verdigrease. Then wet it in continuing to grind it with oil of tartar, till you have made it pretty fluid. Put this into a glass matrass, and bury it five days in hot dung. At the end of that term you will find your composition turned into a fine azure.

CXXV. *The same, as practised in Germany.*

1. Distil in an alembic, one pound of vitriol, half a pound of nitre, and three ounces of cinnabar. In this water put tinsel or copper; they will dissolve. When the dissolution shall be perfected, add a sufficient quantity of calcined pewter to render your liquid quite milk white. Let the whole rest for three days, and then you will have a middling azure.

2. The liquor which stills from the vitriol, cinnabar and nitre, has the power to dissolve any sort of metal whatever.—It has again this additional virtue, that if you rub the forehead of a horse with it, the hair will instantly turn, and remain white at that place.

CXXVI. *Another very fine azure.*

Dissolve in one pound of the strongest double distilled wine vinegar, two ounces of ammoniac salt in powder, one of copper filings, and one pound of the whitest egg shell calx. Put this composition into a copper vessel well stopped, that nothing can possibly exhale from it. Place this for one month in hot horse dung, and at the end of that term you will find a very fine azure.

CXXVII. *Another.*

Take vitriol calcined to redness, one part *sulphur vivum*, two; and quickfilver, three. Mix well all into one powder, which put into a glass retort, and bury it over in hot horse dung for forty days; after which term the composition will be turned into a very fine azure.

§ IX. *Preparation of the* lapis lazuli *to make ultramarine.*

CXXVIII. *1st. The general manipulation of the whole process: each single part of which shall be treated of in particular afterwards.*

1. Take one pound, or whatever quantity you please, of *lapis lazuli*. Let your stones be well chosen, and of that sort which are streaky with gold. Try their quality whether good or bad, which is done thus. Break one bit of it, set it on red-hot coals, and blow as hard as you can for an hour, then take it off and let it cool. If in touching it, it drop like mold or dust, it is a sign it is not worth any thing; but if it remains hard and preserves its colour, it is good. When you have thus made yourself sure of the quality of the stone, break it all in small knobs, put them in a crucible on a melting fire, which by strength of bellows you push on for an hour and a quarter. Then throw them into the strongest double distilled wine vinegar. When they are thus extinguished, take them out to dry, and prepare the following water.

2. Boil a little raw white honey with two pints of water in a glazed pipkin. Skim it so long as there comes any scum on it; then take it off to cool; and, when cold, dissolve in it the bigness of a nut of the best dragon's blood reduced into a subtile powder. Run this dissolution through a white cloth into a glazed earthen pot. Observe to make your water (with that dragon's blood) neither too red, nor too clear, but to keep a just medium between both, that the azure may take a finer hue.—With this liquor grind, for the space of an hour and a half, the abovementioned *lapis lazuli*, then gather it into a large glazed vessel, let it dry in the shade, but guard off the sun, otherwise it will undoubtedly lose its colour. When it is perfectly dry, grind it a-new into a very fine powder, then pack and keep it tied very closely in fine white linen. Then proceed to the following paste.

3. Take two ounces of the best white rosin, an equal quantity of Greek pitch, and the same quantity again of mastich,

maſtich, lintſeed oil, turpentine, and virgin wax. Powder what is powderable, and cut ſmall what is not. Put all into a new glazed pipkin, and boil it to perfection; which you know by letting a drop fall into cold water and taking it out with your fingers. For if it do not ſtick to your fingers, it is done to perfection, and if it do, it is not.—When, therefore, it is done to perfection, run it quite hot through a ſheer cloth into a pan of cold water, wherein leave it till perfectly hard: then take it out and let it dry. When you want to incorporate it with the powder, proceed as follows.

4. Cut this paſte into ſmall bits, and put it to melt over the fire in a well tinned ſaucepan. When the contents come to make a noiſe, throw in two ounces of oil of bitter almonds, and let it boil for about ten minutes. In the mean while have your *lapis lazuli* powder ready in a veſſel, then pour over it gently, and little at a time, what is boiling in the pipkin, obſerving to ſtir carefully while you pour, in order to incorporate well this liquid with the powder, which being done let the whole cool. Then, having rubbed your hands with oil of olive, take this compoſition and work it well in order to incorporate all perfectly: and, after having given it the form of a loaf, put it in a glazed veſſel to keep it for uſe.

5. When you want to draw the azure from it (which muſt not be leſs than twelve days after this laſt operation, and it has laid in this glazed veſſel) begin firſt by making a ſtrong lye with vine wood aſhes, which you ſtrain through a flannel bag, to get it very clear. Then, putting it in a copper boiler, on the fire, till it is ſo hot as not to be able to keep the hand in without ſcalding, you pour ſome of it on what quantity of the above paſte you pleaſe, to extract the azure from, and ſtir it gently till it begins to come out. When, by thus ſtirring your paſte in this lye this laſt is become well charged with the colour, decant it out with another glazed veſſel, of which ſorts of veſſels, you muſt have a good proviſion ready. Then pour again ſome more warm lye on your paſte, and work it the ſame as before, till this new lye ſeems ſufficiently charged with taint and decant it out again into another well glazed veſſel. Pour new warm lye again on your

paſte, and proceed as before, continuing ſo to do till the paſte gives no more taint to the lye.

6. Obſerve, that when the lapis is good, you loſe but four ounces of it out of one pound, and that you extract twelve ounces of azure in the following proportion. Five ounces of very fine ultramarine, by the firſt waſhes; four middling, out of the ſecond waſhes; and three baſe ones, by the laſt waſhes. Each of theſe three different qualities muſt be kept ſeparately, and waſhed in ſeveral clear lyes, by changing them from veſſel to veſſel ſeveral times, with new lye each time. And when they ſeem to you very bright, put them a-drying in a ſhade, but not in the ſun, in a room perfectly free from duſt.

7. When it has been thus perfectly dried, take a glaſs of brandy, in which you have put a-ſoaking a little Braſil wood, and aſperge the ultramarine with that tinged brandy, ſtir it, and let it dry; renew the aſperſion for two or three days, till the azure participates a little of this taint. And, when it is well dried, for the laſt time, you will find it to be of a moſt beautiful hue. Then put it in ſmall leather bags, and keep them well tied.

CXXIX. *2d. Directions to be obſerved in the proceſs of preparing the ſtrong cement, in which the* lapis lazuli *is to be incorporated, to draw afterwards the azure from it.*

1. Take firſt, clear and neat Venetian turpentine, four ounces; fine white roſin, ſix; fine Greek pitch, as much; clear and pure maſtich, three; fine ſhining white wax, an equal quantity; purified lintſeed oil, one and a half. Then have a well glazed pipkin, quite new; put in it firſt the turpentine, and ſet it on a ſmall and mild charcoal fire. Stir it with a wooden ſpatula, like that of apothecaries, till it is well liquified; introduce, next, the roſin to it, by little and little at a time, and incorporate it well; when this is done, add the Greek pitch to it, in the ſame manner, then the maſtich in powder at three or four times, then the wax cut very ſmall, alſo by degrees, and ſtir well till the whole is perfectly incorporated together. Above all, take care to do this with a ſlow fire, otherwiſe theſe matters will undoubtedly burn, as they are of an inflammable nature. At laſt, put the lintſeed oil,

oil, and set the pot on the fire, and let the composition simmer till the cement is quite done, which you know by the following experiment.

2. Turn the spatula all round the pot in the composition, then raising it out, let a drop or two fall into a pan of cold water. If the drop spread on the water, the composition is not done, therefore you must let it simmer longer on the fire. If on the second trial the drop keep in one lump, the matter is done.

3. When the cement has acquired a tolerable degree of coldness in the water, take it out in a lump; and, with your hands imbibed with lintseed oil, prepared and purified, as hereafter directed, for fear it should stick to them, work it so well, that there shall remain no more water about it. When this is performed, the cement is perfectly completed; and, to preserve it, keep it perpetually in cold water. Therefore, in summer, you must change that water every day, and with such precautions, you may preserve it eight or ten years always good for strong cement.

CXXX. *Another cement, of a softer nature.*

1. Take fine Venice turpentine, four ounces; fine white rosin, six; Greek pitch, as much; fine wax, one; and lintseed oil, three parts of an ounce. Prepare this cement after the same way as the other; and observe carefully in the doing of it the same order and circumstances.

2. Observe, however, that this sort of cement is sooner done than the first, and that it will sooner return you the azure than the first, which is harder, will do. But neglect not, if you intend to work the *lapis lazuli* with both these cements, you must begin with the soft first. And yet you are not to be kept ignorant, that if your *lapis lazuli* be not of the best sort (which is the gold streaked sort) you must guard well from giving it the two cements. In the art of preparing and giving the cement or cements, consists entirely that of making the ultramarine azure; in that point lies all your gain or your loss. Therefore take great care to do it well.

CXXXI. *Directions to prepare and purify the lintſeed oil for the azure.*

1. Take whatever quantity you will of fine lintſeed oil, of a fine ſaffron or gold colour. Put it in a glaſs, or bullock's horn, perforated at the ſmall end. Pour over this oil ſome cold water, and ſtir it well with a ſtick, to mix it well, then let it ſettle. When the oil and the water are divided, open the little hole which is at the bottom of the horn, and let the water out. Put ſome freſh water, and repeating the ſame proceſs ſeven or eight times, till the water runs off as clear as you firſt put it in.

2. Thus your oil ſhall be perfectly purified; and in that ſtate you may keep it in a well ſtopped glaſs bottle for uſe.

3. The oil of bitter almonds may abſolutely ſupply the want of this; but beſides its being dearer, it is not near ſo good for the purpoſe.

Note. That whenever we ſhall ſpeak of oil, we always mean lintſeed oil thus prepared and purified.

CXXXII. *The lye to waſh the ultramarine with.*

1. Take eight or ten handfuls of pearl aſhes, made with vine wood aſhes. Put this into a box perforated at the bottom, and large enough to hold a couple of pailfuls of water. Place this baſket, and ſet it ſo that the water cannot run out of it without carrying the aſhes along with it. Stop the hole on the outſide, before putting the aſhes into it, and preſs theſe down very hard, then pour, by degrees, a pailful of warm water over theſe aſhes. When theſe are ſettled again, unſtop the hole, and put a bung, made of an old liſt of white cloth, through which you will make it run drop by drop into a pan. Repeat this diſtillation again, by putting this ſame lye into another perforated box, without any aſhes, and ſtop it with another bung of the ſame kind as the firſt, ſo that you may get your lye fine and clear; and put it to keep in a well glazed veſſel, carefully covered, for fear of the duſt.

2. Now pour another ſimilar quantity of warm water on the ſame aſhes as before; proceed exactly with this ſecond

ſecond water as with the firſt, and keep theſe two ſorts of water for uſe.

3. Repeat again the ſame operation, by pouring a third parcel of water on the ſame aſhes; and proceeding in every reſpect as with the two former, you will be poſſeſſed of three ſorts of lye, of three different degrees of ſtrength.

4. Theſe various ſorts of lyes ſerve to waſh the cement or paſte, in order to draw the azure out, after the method hereafter preſcribed. And, when you want to proceed to work, take of theſe three different ſorts of lye, and mix them ſo as to give them the due degree of ſtrength according as you think requiſite.

CXXXIII. *Another ſort of lye for the ſame purpoſe.*

There is another ſort of lye which can be made to cleanſe the cement of its unctuoſity and greaſe, and which they prepare in the following manner.

1. Take whatever quantity of calcined tartar you like. Boil it for the ſpace of a quarter of an hour, in clear water. Then let it ſettle, and decant it into a glaſs bottle, ſtop it well, and keep it for uſe.

2. It is fit for taking the greaſe off the cement when too unctuous. Likewiſe to waſh the *ultramarine* with, and thereby heighten its colour.

3. This lye has alſo another particular quality, which is that of curing the mange, the itch, and other cutaneous diſorders, by waſhing with it. It purifies and whitens the ſkin prodigiouſly.

CXXXIV. *Directions for the choice of the veſſels in which the moſt impure ultramarine is to be waſhed, in order to be mixed afterwards with the other azure.*

1. The veſſel, if it be an earthen veſſel, it ſhould be well hardened in the baking, and finely glazed in the inſide, or, if of braſs or copper, it ſhould be of a perfect poliſh all round, and at the bottom, in the inſide.

2. It muſt be perforated by the ſide with three holes, to admit of three cocks, one toward the middle part, the

other lower, and the third at two fingers breadth from the bottom.

3. Though the azure matter which is at the bottom of the veſſel appear not to you to be ſuch, let it reſt eight or ten days, and you will be convinced of the contrary. When you plainly perceive ſomewhat of azure at the bottom of the water, decant it out as gently as poſſible; take out that azure, waſh it with clean water, and you will find it as good as the reſt.

CXXXV. *Obſervations for diſcerning the good or bad qualities of the* lapis lazuli, *from which you intend to compoſe ultramarine.*

1ſt Trial. Wet firſt the *lapis lazuli* with common water, and wrap it up in a piece of fine white cloth or ſerge. It will thereby become of a fine luſtre, and purple colour, very agreeable to the ſight.

2d Trial. If you want to know whether or not it be fine, ſet it on blaſting charcoals, and blow them continually for a good while. Then take it off from the fire. If, being cold, it has not loſt much of its colour, it is fine; but if it has loſt none of its colour, none can be finer. For the *lapis* which is of a ſuperior degree of fineneſs, acquires, inſtead of loſing colour, when put to this trial.

3d Trial. For the third experiment, put the *lapis* a reddening on an iron plate over the fire; then extinguiſh it in the beſt double diſtilled white wine vinegar. If by this trial it acquire more colour, it is too fine; if it only keep its own without any alteration, it is good, and ſuch as you can wiſh to have it. The *lapis*, which on that trial acquires more colour, may be worth between thirty and forty ſhillings an ounce. But that which keeps its own natural colour after trials, is really ſcarce. As to that which loſes the colour, you can make but very middling and common ultramarine with it.

4th Trial. When you buy it ready reduced into powder, in order to know whether or not it be pure, and without any mixture. It is this.—Put ſome of this powder into a goldſmith's crucible; ſet it on a ſtrong fire to make it red hot, then take off the crucible. If it be enamel,

mel, you will find it melted, but if it be true pulverised *lapis*, it will remain ſtill a powder. If there be only a mixture of enamel with the pulveriſed *lapis*, that enamel, in melting, will gather up all the *lapis* powder, and when cold you will find it in a little cake at the bottom of the crucible.—This deception is very common among colour-makers.

Remarks. The three different azures, which, by means of the cements above mentioned, you will get from the *lapis*, will amount altogether to fifteen ounces for each pound of *lapis*; that is to ſay, ten ounces of ſuperfine ultramarine, which will ſell for twelve or thirteen ducats an ounce; three ounces of medium, which will ſell for between three or four half crowns, and two ounces of the common baſe ſort, which will ſell for one half crown. This laſt is little regarded, and is called aſhy; but however, it will pay you for the expence of the cement, therefore you will eaſily be able to judge of the clear profit you can make out of it.—If you employ that ſort of *lapis* which loſes all its colour with the trial of the fire and vinegar, you will neither get ſo fine ultramarine from it, nor ſo much in quantity, as you can from the other. And if, as will be mentioned hereafter, you attempt to refine it, it will loſe a great deal of its weight.

CXXXVI. *The method of calcining and preparing the* lapis lazuli, *in order to grind it afterwards.*

1. Take that ſort of *lapis lazuli* which is ſtreaked with gold veins, and which has undergone the abovementioned trials. Break it in ſmall bits no larger than a filbert. Waſh them in warm water, then ſet them on the fire in a crucible till red hot. When thus reddened, take them out one by one, and extinguiſh them in double diſtilled white wine vinegar, which ſhall have been previouſly run through a hat three or four times. When thus extinguiſhed, take them all out again from the vinegar, and calcine them anew, then extinguiſh them again as before. Repeat this operation ſix or ſeven times, that they may more eaſily ſubmit to the peſtle in the mortar, and not ſtick to it.

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2. As for the *lapis*, which loſes its colour by the fire, you muſt diſpenſe with the calcining of it, for as it would loſe it more and more, you would at laſt loſe both your trouble and your money.

3. Therefore, put either that which is calcined, or that which is not, in a bronze mortar, covered over, and pound it well. Sift it through the ſilk ſieve, covered alſo with its lid, that the moſt ſubtile part of the powder ſhould not evaporate, as it is the beſt.

CXXXVII. *Directions for making the liquor fit to grind the* lapis *with, in order to make the ultramarine.*

1. Take three half pints of rain water, after having run through a hat three or four times. Put into a new pipkin, and dilute as much raw honey in it as will render the water yellow; boil it till it ceaſes to give any ſcum, which take care to throw away as faſt as it riſes. When it is quite clear and fine, take it off the fire, bottle it for the following uſe.

2. Have fine dragon's blood, grind it on a porphyry ſtone with the above prepared honey water; put this alſo, when well grinded, into another bottle. Over it pour ſo much honey water, till it acquires a purple colour. Decant it, when ſettled, from the ground, and keep it by itſelf. Such is the ſort of water which is to be uſed to grind the *lapis lazuli* with.

3. *Obſervation.*—Should the *lapis lazuli*, from which you intend to draw your ultramarine, ſhew ſome purple colour of a remarkable hue and beauty, you muſt encourage it by means of the abovementioned honey water, which manage in the following manner. As the degree of purple you are to aim at, ought not to be deep, but rather pale and drawing towards the fleſh more than the red, if the colour which comes from the *lapis* ſhould be too deep, you muſt diminiſh that of the honey water; and if that of the ſtone is too pale, then render that of the liquor deeper.—By theſe means you may make theſe three ſorts of colours of what degree you like, by giving more or leſs of the liquor, and colouring this at your will, according as you ſee either of theſe proceedings requiſite for your purpoſe.

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Note. Chuſe the dragon's blood in tears, ſuch as the goldſmiths uſe, not that which is in powder.

CXXXVIII. *The method of grinding the* lapis lazuli *on porphyry, and the ſigns which attend it.*

1. When the *lapis* is well pounded into powder, and that powder has been ſifted, as before directed, ſet it on porphyry-ſtone, and grind with the mullar, bathing it, as you grind it, with the honey water, by little and little at a time.—Keep your powder on the ſtone, in as ſmall a compaſs as you can.

To grind thus, one pound of pulveriſed *lapis*, you muſt divide it into three parcels, and grind one of each, and no more, at a time; and it muſt take two hours grinding at leaſt, to make money of it.—Take care to keep your ſtone wet with the above prepared honey water all about your paſte, that this ſhould not ſtick to the ſtone while you grind it. This wetting muſt take, in all, about one tumbler full of the liquor for the whole pound of *lapis* powder.—When you have grinded one part of that pound, take it out, and grind the ſecond on the ſame ſpot on the ſtone, then the next, and ſo on, as long as you have any to grind; and be very ſure that in grinding it, you uſe no other water than honey water.

2. To know whether or not it be ſufficien ly grinded, take a little on the tip of your finger, and maſh it between your fore-teeth. If you do not feel it crack as the dry powder does, then it is ſufficiently grinded.—Take care not to grind it too much, leſt it ſhould loſe its colour, which happens ſometimes.

3. To dry the *lapis*, after it is grinded, put it on a clean ſtone, and ſet it to dry in the ſhade, not in the ſun, for it would ſpoil it.——When it looks as if it were dry, touch it with the finger, and if it rubs into powder, as mould or dirt would do, you may leave it longer. But if it reſiſt the finger, and does not break, then it is time to take it off.

4. Then comes the waſhing of that ultramarine azure, which is performed as follows. Take a new china bowl, without any crack or rivetting whatever, and of the moſt

moſt perfect poliſh or glaze in the inſide, put therein your dried lump of paſte. Over it, pour the ſoft lye above deſcribed, and let it ſurpaſs the lump in the bowl by four fingers breadth. Then waſh it well between both your hands, and dilute all entirely into that lye. When that is done, let it ſettle, and when the azure is entirely precipitated at the bottom, and the lye ſwims quite clear over it, decant it out gently by inclination, and ſet the azure a drying in the ſhade, without moving it from the bowl. When you find it pretty dry, take it out carefully, ſpread it on the porphyry ſtone, to finiſh drying. And when it is thoroughly dry, in that manner, give it the cement as follows.

CXXXIX. *The method of incorporating the grinded* lapis lazuli, *with either of the ſtrong or ſoft cements.*

1. For one pound of the *lapis lazuli*, prepared as directed in the preceding article, take one of the ſtrong cements deſcribed. Rub this over with your hands, as you take it out of the water, in which preſerve it: then cut it in ſmall bits, and put it a melting over warm aſhes, in a glazed new pipkin. Take care that, in melting, it ſhould not *fry*. When this happens, put a little lintſeed oil, and it will immediately ceaſe to fry.

2. When the cement is perfectly well diſſolved, take that ſame ſpatula which before ſerved you to make it with, rub it over with a little of the ſame oil, and ſtir well the melted cement with it. Then with the other hand, taking a pound of prepared *lapis lazuli*, let it run ſlowly into your cement, till the whole pound is put into the cement, which you muſt never ceaſe to ſtir and mix, with the ſpatula, as long as you pour in the *lapis*. Continue ſtill to ſtir after that, till you are well convinced that the *lapis* and the cement are both perfectly well mixed and amalgamated together.

3. When this is done, take immediately the pot, and pour the contents, quite boiling, into a veſſel full of cold water, and with the ſpatula take out all that is about the ſides of it, and clean it well. Then, when the ſaid cement ſhall be cold enough to admit touching it with your hands,

hands, rub them all over with purified lintseed oil, and take it out of the water. If in pulling it, you see it is well tinged and coloured, it is a good omen. Work it well then between your hands, and with your fingers, for near two hours, pulling it the same time to the length and breadth, to see whether or not there are not some bubbles including little parcels of powder not well divided and incorporated, and that you may spread them in the cement in working. Take notice, that the more the paste is thus wrought, the better it will be afterwards, as it will require less washing to get the azure out of it.

4. When it is thus wrought, form it into a lump like a loaf of bread, and put it into a china bowl with fresh cold water, where you shall let it soak for ten or fifteen days longer, because the longer it soaks, the finer and more perfect it becomes, and the more easy to get the azure out. But if it be not soaked at least twelve days, it will not do at all.

CXL. *Directions for extracting the azure out of the cement.*

1. Take the lump of cement, just mentioned, out of the cold water in which you left it to soak. Rub it softly over with your hands, and place it in a finely glazed china bowl, previously wet with the aforesaid lintseed oil.

2. Pour over it lukewarm common water, filtered thro' a hat before warming. Observe that this water, when poured on the cement, be rather cool than warm, and let there be about two fingers breadth in the bowl above the cement. Then let it soak there about one quarter of an hour.

3. Have two sticks made of box, or other fine and hard wood, susceptible of a fine polish. These sticks must be made round by a turner, of a foot long or thereabouts, a little thicker than one's thumb, being larger at one of the ends, and flattened in form of an almond.

4. With these sticks move and turn gently at first, your cement in lukewarm water. And if in so doing, it should stick to the bottom of the bowl, rub your hands with oil, and detach it carefully, turning and returning it gently

gently with your hands in the water, till at laſt it begins to be tinged with azure.—The firſt ſigns by which you know that the cement begins to render the ultramarine, are certain lines and ſtreaks which appear in the water, not unlike the rays of the ſun. And when this is the caſe, take notice that the water ſoon aſſumes a high hue of that colour, particularly at the firſt diſcharge of the cement, as it is always the beſt azure which comes firſt.

5. As ſoon therefore as you ſee your water ſufficiently tinged, pour it out through a ſieve into the veſſel with three cocks, deſcribed before, ſupporting the cement on two ſticks, for fear it ſhould ſtick to the bottom of the bowl, when thus left dry on it. The reaſon why you are adviſed to run this water through a ſieve, is to prevent any little bits of cement which have broken from the lump, and be looſe in the water, from running along with it, and that ſo you might ſtop and rejoin it to the other.

6. When you have got this firſt water out of the cement, pour ſome more water, of the ſame degree of warmth, rather under lukewarm than above, and proceed as before with your ſticks, moving and turning the cement, and ſo working it as to get new azure from it, which decant into another veſſel ſeparately from the firſt water.

7. Repeat again the ſame proceſs, to draw the third azure, and decant again this into another veſſel by itſelf.

Obſerve not to hurry, particularly at firſt, the ſoftening of the cement in the water, by working it too haſtily, if you force the azure too precipitately out of the cement, you will manifeſtly ſpoil all.

CXLI. *Obſervations on the colours of the azures, at their coming out of the cement, and the ſigns which attend them.*

1. The moſt manifeſt ſign of the firſt azure coming out, is its apparent coarſeneſs; a character which is owing to the veins of gold which appeared in the original ſtone, and which give the firſt ultramarine that ſort of look.

2. The ſecond azure will ſeem finer, but its colour will not be ſo high, nor ſo fine.

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3. The third will increaſe again in appearance of fineneſs, but diminiſh ſtill more in hue, which will be of a much paler blue than any of the two others.—Theſe obſervations are always on the ſuppoſition that the original ſtone was a good one, and had gone fairly through all the trials.

CXLII. *The waſhing and purifying of the azures after they are got out of the cement.*

When the different azures are all got out of the cement, let them ſettle and fall down, each at the bottom of their veſſels. When their waters appear quite clear and free from them on the top, pour them out gently and carefully, by inclination; then ſupply them with ſoft lye, and waſh thoſe azures in it with your hands, and each of them diſtinctly in ſeparate veſſels by themſelves. Then let them ſettle to the bottom, and decant out that lye, and repeat again and again the ſame proceſs, till you are ſure they are all well purged from the greaſe of the cement in which they were. Rinſe them afterwards in three or four different clear waters, filtered through a hat, and they will be perfectly purified and clean.

CXLIII. *Another way of purifying the ſame azures with yolks of eggs.*

1. Take half-a-dozen of yolks of eggs, from hens fed upon corn, and not ſuffered to run among the graſs. Pierce the *pellicula* which covers thoſe yolks with the point of a needle, and pour equally thoſe yolks on the azure powder, as you would do oil on a ſallad.

2. Do the ſame on all your different azures, put ſeparately in different diſhes. Then incorporate well the azure and the yolks of eggs together with your hands. When done, waſh it afterwards with the ſofteſt lye, ſo many times that it ſhall at laſt come out as clear as you firſt put it in; then rinſe it three or four times in clear water, which has been filtered ſeveral times through a hat.

This method of waſhing the azures is an excellent one. It may be deemed a true ſecret to give them a fine luſtre and brilliancy. Never forget to let each of your waters

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be well fett'ed before you change them, otherwiſe you will loſe a great deal of your azures.

CXLIV. *Another ſecret for purifying azures.*

To give the moſt admirable luſtre to azures.—Take a bullock's gall, and pour it on your ſeparate azures, after they have been already waſhed and purified in waters, lyes, and yolks of eggs. Then rub and handle well thoſe azures with your hands, each by themſelves, and one after another diſtinctly, for fear of mixing ſome of the one with any of the others. Then waſh them as above directed.

CXLV. *How to run the azures, after having been thus cleanſed, waſhed and purified.*

1. The ultramarine azure, as well as all the others, ought to be run, for fear there ſhould remain ſome greaſe, dirt, or bit of cement among them. Therefore, when they come to the laſt water, run them through a fine ſieve, then through another more open, and through another again more ſo ſtill. Each time let the waters ſettle till you have them quite clear, or take them out by means of a ſponge, as before directed, but do it with ſuch care as not to have your azure get into the ſponge with the water, which would be very detrimental to your intereſt.

2. When you have well cleared all the waters away, let thoſe azures all dry in their own diſhes or bowls, and in the ſhade, not in the ſun, and guard well againſt duſt and dirt in working them.

3. When the azures are perfectly dry, gather them each ſeparately, and put them in ſmall white bags made of animals ſkins with the ſmoothſt ſide inwards. When the little bag is tied, rub it all manner of ways, to refine the azure in it; and the more you ſhall have done ſo, the fine colour the azure will acquire when you open it, and it comes to the air again.

CXLVI. *The*

CXLVI. *The method of making the green azure.*

1. With the Armenian ſtone, if we are to believe *Alexander Trollian*, who ſays, that it is enough to reduce that ſtone into powder on the marble or porphyry, then waſh it ſeveral times in clean water, and dry it afterwards.—But it muſt certainly be far preferable to ſeparate the colour from the conſtituent matter of the ſtone, and all its earthy particles, which muſt undoubtedly render it much finer and fitter for painting, as it is more purified of its heterogeneous parts. Therefore, the following proceſs is moſt adviſeable.

2. Reduce the ſtone into a ſubtile powder, then put it into brandy or diſtilled vinegar. Put this to digeſt on the hot aſhes bath, *or balneo mariæ*, till the liquor is perfectly charged with the colour of the ſtone. Decant it then gently into another veſſel, and pour ſome more brandy or vinegar on its ground, if you have reaſon to think that there remains ſome colour ſtill in the ſtone, throw away all the ground, as perfectly uſeleſs, and then evaporate, on warm aſhes, the vinegar or brandy impregnated with the colour; or rather diſtil it, as by that means you will get your liquor pure again, and may uſe it another time for the ſame purpoſe, inſtead of waſhing it away.

3. By this proceſs, which ſeems moſt rational, you will get the green colour quite pure at the bottom of the veſſel. Waſh and clean it pure with water, and after dying, keep it for uſe. This is a very fine colour in painting, and has this advantage, that it never loſes its brightneſs.

CXLVII. *Another ſort of green azure.*

1. Which is a natural production, found in copper-mines, and is as it were a diſſolution, or ſublimization, of copper, which flies and ſticks on the ſtones it meets in its way. Theſe ſorts of vapours have generally ſome marks or ſigns of a mixture of ſilver, as it may be inferred from the colour or ſtain of thoſe ſtones which partake of both theſe metals, for they are green by the copper, and mixed with azure by the ſilver. And according as either

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of these metals is more or less predominant in the mine, one of these colours is likewise stronger in the same proportion. The method of collecting is as follows.

2. Grind the stone on which it is, and wash it several times over. It needs not be put in the cement after the method observed for the ultramarine azure, because that metallic efflorescence of the green azure, is very easily separated from the stony matter to which it is affixed. For which reason it needs only to be washed to render it as fine a colour as can possibly be; and after it has been well washed, dry it in the shade, and keep it for use.

CXLVIII. *A very fine method for marbling paper.*

The paper must first be prepared, by wetting the paper with a sponge dipped in roch-alum water, then letting it dry.—When the sheets have been thus prepared, have a pan full of water, and with a large and long-handled painting-brush, take of one colour, and shake it in the water; take of another and do the same, and so on till you have taken of all the colours you intend to have on your paper. Each of these colours fall to the bottom of the water; but take with a similar brush as the first, a mixture of bullock's gall, and of dissolution of soap in water, then shake on the water, and all over its surface, and you will soon see all the colours rising up again and swimming on the top of the water each separately as you first put them. Then lay the sheet of paper on it, give it a turn on one side or the other, as you like, and take it up again; wash and set it to dry, then burnish it, and it is done.

CHAP.

CHAP. VII.

SECRETS relative to the ART of GILDING.

I. *The method of gilding with ſize, or oil.*

THE gold leaves which are commonly uſed in gilding are of different ſizes, as well as of various degrees of thickneſs.

To gild on iron and other metals, the ſtrongeſt and the pureſt are preferable. That which is not ſo p re is commonly employed by carvers in wood, as it comes cheaper to them.

We are indebted to this diſcovery of the ſecret in painting in oil, for the means of gilding in ſuch a manner as to reſiſt the injuries of the weather.—An art the ancients were not acquainted with, and they could not obtain from their method of applying gold, ſince they uſed nothing elſe but whites of eggs for gilding marble, and ſuch other bodies as do not admit of being committed to the fire. As for the wood, they made a compoſition which was uſed with ſize. But neither ſize nor whites of eggs can reſiſt the water. Therefore they could not, with propriety, gild any other works than ſuch as were ſheltered from the intemperance of the weather, *viz.* their arches, their ceilings, which were all gilt in that manner. The compoſition they uſed for gilding on wood was made of a ſlimy earth, which held the place of the ſized white we uſe now-a-days, and with which gilders made that firſt coat, called by artiſts *aſſiette*, or burniſh-gold ſize.

II. *To gild with ſize, or what is called in burniſh gold.*

1. Begin by preparing your ſize as follows.—Take about a pound of odd bits of parchment, or leather, ſuch as is prepared for gloves or breeches. Put this a boiling in a pailful of water, till it is reduced to one half, and your ſize is done as it ought to be.

2. When you want to uſe it for wood which is to be gilt, it muſt be boiling hot, otherwiſe it would not penetrate ſufficiently into the wood. If you find it too ſtrong, you may weaken it, by adding water to it. Then with a bruſh, lay the ſize in ſmooth, if it be a plain work; but if a carved one, you muſt lay it in ſtumping with the bruſh; either of which ways is equally termed to *ſize*.

3. When the wood is thus prepared with ſize only, make another preparation, called *an infuſion of white*, in the following manner. Take a quantity of ſize boiling hot, as much as you think will be ſufficient for your work. Dilute a diſcretionable quantity of pulveriſed whitening in it, and let it infuſe ſome time. When it ſeems well diſſolved, ſtrain it through a cloth to make it finer; then with a bruſh, as above, give ſeven or eight different coats of it in ſtumping on your work, and two more coats in ſmoothening, if it be on carved work; but if on a plain one, you muſt give a dozen of coats at leaſt; for the white is the nouriſhment of gold, and ſerves to preſerve it a great while.—Be careful not to give coat upon coat, unleſs the laſt be very dry; otherwiſe the work might ſcale. You muſt even have a great care that each coat ſhould be laid on as perfectly equal as poſſible, both in the ſtrength of the ſize, and thickneſs of the white, to avoid the ſame inconveniency.

4. When you have given the requiſite number of coats, whether in ſtumping, or in ſmoothening, you muſt let the work dry thoroughly before you poliſh it. As ſoon therefore as it is perfectly dry, you muſt have a coarſe rough cloth, quite new, and as cloſely weaved as poſſible, with little deal ſticks, cut ſquare, angular, or pecked, according as the nature and carving of the work require; and thruſting one of theſe ſticks into the cloth, rub

and

and ſmoothen the white. Then taking a bruſh made of boar's briſtles, which has been already uſed, becauſe it is ſofter, dip it into ſome clean water, and wet the work in proportion as you go on in poliſhing, with your little ſticks wrapped up in cloth. This precaution completes the ſmoothening of the work, by levelling the ſmall bumps and imperceptible undulations you may have made either in giving the white, or in poliſhing it. For the ſmoother the work, the more eaſy to burniſh the gold, after having been applied. Wet and bruſh it in proportion as you poliſh it, with a bruſh a little worn, ſpare not to purge your bruſh of all the filth it gathers about the point of its hair, by waſhing and ſqueezing it again as ſoon as you ſee them grow thick in the leaſt with that dirt.

5. When the white is once more dried, rub it with ſhavegraſs, or ruſhes, in order to level ſtill better all the grains and inequalities which may be on it. Do not however rub it too much with the ſhavegraſs, becauſe you may thereby fall from one error into another, and make your white what is called greaſy or ſmeary, which would prevent it afterwards from uniting with the burniſh gold ſize, which is to precede the laying on of the gold.

6. Now, as it is difficult that after ten or a dozen of coats of white the carving ſhould not be choaked up, they who are fond of finiſhing their work highly, take an iron inſtrument, made on purpoſe, and curved by one end, (called by the French, a *fer-a retirer*); with this raffling-crook they go over all the turns, and open all the places which want it, to reſtore them to their former ſharpneſs. Or elſe, take what is called a *fermoir*, or *gouge*, and give to the ornaments the ſame form which the carver obſerved when he firſt cut them, turning agreeably the ſides of leaves according to nature; then bretelling with another inſtrument, called the *veining crook*, (in French *fermoir à nezrond*), all the ornaments, you thereby render neater, and more delicate than the carver had firſt made it. That you may cut the white more neat, obſerve only to wet it a little with a bruſh.

7. When works are not of great consequence, you may easily save yourself all that trouble; principally if the carving is pretty neatly finished, by giving two or three coats only of white very clear. But the white is the principal support of gold, this operation is never so perfect as when it has received ten or twelve coats of white, and been afterwards re-cut, carved, veined, and repaired over again, as I said before.

8. Then dilute some yellow ochre, and grind it with sized water, weaker by half than that which you used for the whitening. And having made it a little fluid and warm, lay one coat of it over all the work, principally in such deep places of the carving as you cannot come at to lay the gold leaf, that this colour may supply its want.

9. When the yellow is dry, lay over it (in all the raised places, but not in the bottom grounds) three different coats of another sort of composition, called in French, *assiette*, and here, *burnish-gold size*, prepared in the following manner.—Bol armenian, about the bigness of a nut, and grinded by itself; blood stone, or red chalk, the bulk of a horse bean, and black lead pulverised as big as a pea, grinded both together; and at last one drop or two of tallow, which grind afterwards with all the other drugs and water, taking them a little at a time, to grind and incorporate them the better.——Put this composition in a cup, and pour over it some of your aforementioned size, boiling hot, and strained through a cloth. Stir and mix all well, while you pour that size, that the whole may be well diluted. The brush you lay it on with ought to be soft, and the first coat lay pretty thin; but as for the two others, they must be so thick that the stuff should run with difficulty from the brush. Each coat must be well dried before giving the next. And when the last is also perfectly dry, take a stiffer brush, and dry-rub the work all over, to smoothen all the grains and little risings of the gold size, and thereby facilitate the burnishing.

10. The gilding is performed as follows. Have first a pipkin very clean, in which put some very clean and filtered water, and a few wetting pencils, which ought to be

be made in the form of thoſe ermine tails which hang in the ermine ſkins.—Get next a cuſhion, which is to be made with a light and flat ſquare board covered with calf leather, fixed all round with nails, and ſtuffed underneath with cotton. Let this cuſhion be alſo ſurrounded by the back part, and two thirds of each of the two ſides, with a band of parchment of five or ſix inches high, to prevent the air from blowing off the gold leaf.

11. Put what quantity of gold leaves you think proper. With the gilding knife ſpread theſe leaves very ſmooth, in doing of which you will aſſiſt yourſelf very much if you breathe over them while you paſs the knife under. Then cut it in as many parts and ſizes as you want, or, if there be occaſion for it whole, take it with your tip, and lay it.—A tip (in French, *palette*) is an inſtrument made with the point of a ſquirrel's tail placed upon a round ſtick flattened, and about half an inch wide by one end, with a ſlit, to ſet and ſpread the better the ſquirrel's tail.—This tip paſs along your cheek, and with it take off the gold leaf, or what part of it you have divided, and thus lay it on the work. Previouſly, however, to this, you muſt have paſſed on the place one of your pencils immediately before the laying of the gold, otherwiſe the gold would be inceſſantly ſlitting and cracking.—As ſoon as the gold leaf is laid on the work, take your water pencil quite wet, and paſſing it above it on the work, let the water run from it under the leaf juſt applied; this will immediately make it ſpread and catch. But if it ſhould paſs over the gold leaf, it would immediately ſpot and ſpoil it; and as it is impoſſible to lay on gold, eſpecially when wet, you would not be able to repair it unleſs you take the gold leaf entirely off, and put another in the ſtead. On the contrary, by the water ſlipping under the gold leaf juſt laid, you will find that this ſpreads infinitely more eaſy, and almoſt of itſelf; it ſticks faſter on the gold ſize, never ſcratches, is more eaſily duſted for burniſhing, or matting with ſize; in ſhort, the work

looks infinitely better in every reſpect.—As it is impoſſible, with all poſſible care, but there may happen ſome little accident now and then, principally in carved works, you muſt, in ſuch a caſe, cut ſome ſmall bits of gold, which, with a pencil, take and put on the defective places when you look your work over.

12. When the work is perfectly dry, burniſh it where you think proper, in order to detach certain parts from the other, to make them ſet off and ſhew to better advantage. To that effect uſe an inſtrument called a *burniſher*, made either of a real Wolf's tooth, or rather as they now uſe it, an agate, made in the ſame form, and finely poliſhed, or elſe a pebble called *blood ſtone*.—Before burniſhing, you muſt, with the crooked point of your burniſher, puſh down all the parts of gold in the hollow parts which you forgot to do with the pencil, then duſt it with a large one. When the work is burniſhed where you want it to be ſo, matt and repaſs, with a very ſoft pencil and burniſh gold ſize, what has not been burniſhed; or, you may again put ſome vermilion, to raiſe the gold, and make it look brighter; which is called, in term of art, *repaſſing*.

13. There is again another repaſſing you muſt not forget, which is to lay, in all the hollow places of a carved work, a coat of a compoſition of a vermilion, as I am going to preſcribe, and which will give an incomparable fire to the gold, and make it look as goldſmith's work. This compoſition is ſuch.—Grind together, on marble, ſome vermilion, gamboge, and red brown, which mix with a little Venetian turpentine, and oil of turpentine.—If, after having burniſhed, matted, and repaſſed your work, you find again ſome defective places, you may mend them with gold in ſhell, which is diluted with a little gum arabic, and applied with a pencil. This ſort of faulting is no ſmall addition to the beauty and richneſs of the work, the French call *buckling with gold in ſhell*.

III. *To gild without gold.*

Put in a crucible one ounce of ammoniac ſalt, and half that

that quantity of common mercury. Cover and lute well the crucible for fear the mercury ſhould exhale. Give this a ſmall fire for the ſpace of half an hour. Increaſe the fire afterwards till the crucible is quite red hot. Then throw the compoſition into a pan of cold water. As ſoon as this matter is cold, it will be as hard as a ſtone. Break and grind it, and diſſolve it in gum water. Whereever you lay a coat of this, it will look like gilt.

IV. *Another to the ſame purpoſe.*

To gild frames, and other common things, pulveriſe and incorporate well together the yolk of an egg with two ounces of mercury, and one of ammoniac ſalt. Put this into a matraſs, ſtop it well, and ſet it, for four and twenty days, in hot horſe dung.

V. *A gold without gold.*

Grind ſome purpurine with water; then put it to ſoak with chamber-lye in a pan; ſtir and ſkim it. When it has done throwing any ſcum, decant the chamber-lye, and ſupply it by gum water. Whatever you write or draw with this compoſition will look as gold itſelf; and it admits even of being burniſhed with the burniſher.

VI. *The preparation of the gum-water.*

In half a pint of common water, put two ounces of gum-arabic, bruiſed in ſmall bits. When diſſolved, it makes the right degree of gum-water to be uſed for the above purpoſe.

VII. *To write in gold or ſilver.*

Draw the juice of juniper leaves. In this juice throw ſome gold or ſilver filings, which ſet there to infuſe for three days: then make the trial.

VIII. *To gild on glaſſes, earthen, or china wares.*

Take a glaſs, or china cup, wet it, and lay your gold where and how you like, then let it dry. Diſſolve ſome

borax in water, and of this liquor lay a coat on your gold. Set it in the fire till your glaſs powder in melting makes a varniſh on the gilded parts, which will then appear very beautiful.

IX. *To write, or paint, in gold colour.*

Pulveriſe ſome purpurine into ſubtile powder; then water it over gently, and by little at a time, with chamber-lye, turning inceſſantly, while you pour, with a ſtick. Let it ſettle, and waſh it in common water, ſo many times till you ſee the water comes out at laſt quite clear. Each time you change the water take particular care to allow a ſufficient time for the ſettling. Then mix after the laſt water is poured away, ſome powder of ſaffron and gum-water with your ground, and either write or paint, which you like. This ſecret is by no means an indifferent one; and you will find it very agreeable if you try.

X. *To write, or paint, in ſilver, eſpecially with a pencil.*

Pound well, in a bell metal mortar, ſome tin glaſs; then grind, and dilute it, on porphyry, with common water. Let it ſettle, and throw off the water, which will be black and dirty. Reiterate this lotion ſo many times till the water remains clear. Then dilute it in gum-water, and either write or paint with it. It will appear very handſome, and no ways inferior to the fineſt virgin ſilver.

XI. *To whiten and ſilver copper medals.*

1. Take filings from Cornwall pewter, and make a bed of them at the bottom of a pipkin. On this bed lay one of your medals, taking care however they ſhould not touch each other. Make another bed of filings over theſe medals, and one of medals again on theſe filings. Continue this alternate ſtratification of medals and filings, till you have laid all the medals you wanted to whiten.

2. When this is done, fill up your pan with water, and put on it a powder compoſed of roch-alum and tartar from

from Montpellier, well grinded and mixed together. Boil the whole till the whitening of the medals is complete.

N. B. They muſt have previouſly been cleanſed with ſoft ſand, or ſtrong lye, to purge them from any greaſe.

XII. *A water to gild iron.*

In three pounds of river-water, boil roch-alum, one ounce, Roman vitriol as much, verdigreaſe half an ounce, gem ſalt three, and orpine one. Then add tartar half an ounce, and the ſame quantity of common ſalt. Boil it again with this addition. Now heat your iron, and when warm, rub it over with this ſtuff quite hot, then dry it by the fire, and burniſh.

XIII. *To whiten exteriorly copper ſtatues.*

Take ſilver-cryſtals, ammoniac, gem, common and alkali ſalts, of each of all theſe two drachms. Make all into a paſte with common water. Lay your figures over with it, and ſet them on red-hot charcoals till they ſmoak no more.

XIV. *To write in gold letters on pots, or boxes.*

Diſſolve iſinglaſs in water. When reduced into a ſize, or glue, dilute ſome red tartar with it, after having made it into a very ſubtile powder. With this mixture, and a pen, or a pencil, write on your pots or boxes; then put a thick gold leaf on it of the ſame ſort as metal-gilders uſe. And, when this is dry, burniſh as uſual.

XV. *To gild ſilver in water-gilding without the aſſiſtance of mercury.*

1. Take firſt the fineſt gold, forge it weakiſh, then cut it in bits and neal it, on an iron plate, or in a crucible.

2. Have next a glaſs matraſs, put your gold in, and to every drachm of gold, put half a pound of ammoniac ſalt, and two ounces of good *aquafortis*. Cover the matraſs with a ſheet of paper, turned conically by one of its cor-

ners upon one of the long ſides, ſo as to form a funnel with the ſmalleſt, and not quite cloſe, but terminated in a ſmall orifice, to give a free paſſage to the fumes of the *aqua-fortis*. Set this matraſs on a very ſlow fire, that the gold may have time to diſſolve gently and gradually, and ſhake often the matraſs to help the diſſolution. Be very careful not to make the fire too ſtrong; for the gold would inſtantly ſublime and waſte itſelf all into vapours.

3. When the gold is entirely diſſolved, pour this liquor into a glaſs, or china bowl; wet ſome old coarſe linen rags on them, which ſet to drain on ſmall ſticks on another bowl, doing the ſame with what drains from them till you have uſed all your liquor; then dry them before a gentle fire.

4. When dry, lay them on a marble ſtone, and ſet them on fire. And as ſoon as they are conſumed, grind them into a fine powder, which put afterwards into a crucible on a little fire. When this powder is lighted like ſparkles of fire, put it on the marble again, and ſtir it with an iron rod till you ſee no more fire. Grind it then again as before, as much as you poſſibly can, and it is fit for gilding any ſort of ſilver work you pleaſe.

XVI. *The* ſauce *to be uſed for colouring ſilver plates, gilt with the above deſcribed powder.*

1. Grind well together, into a ſubtile powder, ſulphur and pearl aſhes, of each one ounce, and two of common ſalt.

2. Then, when you want to colour your gilt plates, have a quart of water, and half a pint of chamber-lye, in which mix a large ſpoonful of the above powder. Set this to boil in a red copper pot, very clean. When this ſauce boils, hold the plate with a ſilver wire, and then plunge it in; there leave it for about a minute, or two at moſt; then take it out again by the ſame wire without touching it with your hands, and plunge it in the ſame manner in cold clean water. Should it then not look high coloured to your ſatisfaction, put it again in as before, till you find it ſufficiently coloured.

3. The

3. The next ſtep is to give the piece thus coloured to the burniſher, with a ſtrict charge not to uſe any vinegar in his burniſh. This receipt is a very good and particular ſecret.

XVII. *A water which gilds copper and bronze. A ſecret very uſeful for watch and pin makers.*

Diſſolve equal parts of green vitriol and ammoniac ſalt in good double diſtilled vinegar; then vaporate the vinegar, and put it in the retort to diſtil. If in the product of the diſtillation you ſteep your metal after being poliſhed and made hot, it will come out perfectly well gilt.

XVIII. *Another.*

Take burnt copper and ammoniac ſalt, equal parts; *alumen plumeum*, four ounces; common ſalt decrepitated, as much. Diſſolve the whole in double diſtilled vinegar, then vaporate this vinegar. Diſtil from the reſt an *aqua-fortis*, in which if you extinguiſh, five or ſix times, braſs, copper, iron, or ſilver, made hot, theſe metals will aſſume the colour of gold.

XIX. *To gild ſteel or iron, after being well poliſhed.*

Take ſeven ounces of orpine; *terra merita*, one and a half; ſucotrine aloes, four and a half; gamboge, three and a half. Put all into powder, and put it in a retort, with ſo much of pickle water as will cover theſe powders by two fingers. Stir well, and mix all together, let it infuſe four and twenty hours and diſtil. With the liquor which comes from the diſtillation, keep by for uſe, rub the ſteel, iron, or copper, and ſet it to dry in the ſhade.

XX. *To ſilver copper figures.*

1. Cleanſe well firſt the figures with a ſtrong lye, made with either pearl or brill aſhes, or common ſalt, or alum, no matter which. Wipe them well when done, and rub them with a compoſition of tartar and ammoniac ſalt

mixed (by means of *aquafortis*) with a little diſſolution of ſilver.

2. Now with a piece of leather, wetted in your ſpittle, take of theſe powders, and rub the copper figures till they are ſufficiently ſilvered.

XXI. *To ſilver or gild pewter.*

1. Take one of the fineſt and moſt delicate goldſmith's wire-bruſhes; rub your pewter with it ſo as to mark it with the ſtrokes of the bruſh. When done, lay a double gold or ſilver leaf on that place of the pewter; then put over it a piece of ſkin or leather, and over that ſkin ſome putty. With a burniſher rub, for a good while, on that putty; then with a piece of pewter on the naked gold without either ſkin or putty.

2. Have a care that the pewter be very clean, and that your breath ſhould not go over it. Therefore to do that operation, you muſt put your handkerchief before your mouth, and manage it ſo in tying it, that there ſhould be a paſſage preſerved on each ſide of your face which ſhould drive your breath along your cheeks, round your head, and quite up behind your ears.

XXII. *A compoſition to lay on lead, tin, or any other metal, in order to hold faſt the ready gilt leaves of pewter which are applied on it; uſeful for gilding on high ſteeples, domes, &c.*

1. Melt together, on a ſlow fire, black pitch, two pounds; oil of turpentine, four ounces; and a little roſin. When the whole is diſſolved and mixed well into a kind of varniſh, lay a coat of it on your work.

2. Upon ſteeples, the common method of gilding cannot, on account of the wind, be practiſed; have only the exact meaſures and dimenſions of the place intended to be gilt, then, at home, and at leiſure, cut to them ſome fine leaves of pewter, and gild them as uſual. When done, you have no more to do but to carry up theſe pewter leaves, rolled in a baſket, and having burniſhed the place on which they are to be applied with the

the above compoſition, lay the gilt pewter leaves on it, and they will ſtand faſt enough.

XXIII. *To clean and whiten ſilver.*

1. Raſp four ounces of dry white ſoap in a diſh. Pour a pint of warm water on it.—In another diſh put a pennyworth of wine lye dried in cakes, and the ſame quantity of the ſame water.—In a third diſh put alſo another pennyworth of pearl aſhes, with another ſimilar quantity of the ſame water.

2. Then, with a hair bruſh ſteeped firſt in the wine lye, then in the pearl aſh, and laſtly in the ſoap liquors, rub your ſilver plate, and waſh it afterwards with warm water, and wipe it with a dry cloth kept on a horſe before the fire for that purpoſe.

XXIV. *The preparation of gold in ſhell.*

Take ammoniac ſalt, and gold leaves, equal quantities. Bruiſe this in a mortar for two or three hours; and towards the end add a diſcretionable quantity of honey.

XXV. *To bronze in gold colour.*

Rub the figure firſt with *aquafortis*, in order to cleanſe and ungreaſe it well. Then grind on porphyry, into a ſubtile powder, and mix with lintſeed oil, equal quantities of *terra merita* and gold litharge. With this compoſition paint the figure over.

XXVI. *Another to the ſame purpoſe.*

Take gum elemy, twelve drachms, and melt it. Add one ounce of crude mercury, and two of ammoniac ſalt. Put all in a glaſs phial, and ſet it in a pot full of aſhes; lute well the phial, and melt the contents. When perfectly diſſolved, add a diſcretionable quantity of orpine and braſs filings; mix all well, and with a pencil paint what you will over with it.

XXVII. *How to matt burniſhed gold.*

Grind together blood-ſtone and vermilion with the white of an egg. Then with a pencil lay it in the bottom grounds.

XXVIII. *How to do the ſame to burniſh ſilver.*

Grind ceruſe-white with plain water firſt, then with a very weak iſinglaſs water, and make the ſame uſe of this as of the other.

XXIX. *The method of applying gold, or ſilver, in ſhell, on the wood.*

Black wood, or that which is dyed ſo, is the fitteſt to admit of this operation. The method of applying it is this.

1. Take a little gum adragant, which dilute in a good deal of water, to make it weak. With this weak gum water dilute your gold or ſilver; and with a pencil, lay it on ſuch places of your work as receive and ſhew the light, without touching on thoſe which are the ſhades. To expreſs theſe, touch the parts with indigo diluted in a very weak gum arabic water.

2. When this is done, lay one coat of drying varniſh, made of oil of ſpike and ſandarac. If the varniſh be too thick, thin it with a little oil; and in mixing it, take care not to boil it ſo hard but you may bear ſome on your hand without ſcalding the place.

N. B. Have attention to make your gum-waters for this ſort of work always very weak; otherwiſe they would tarniſh and ſpoil all the gold or ſilver.

XXX. *To gild ſandy gold.*

Take any colour, and grind it either with oil, or with gum. Lay a few coats of it on your work, according as you think there may be need of it. When dry, lay one coat of ſize, and while it is ſtill freſh, ſift ſome braſs filings on it; let it dry ſo, and varniſh it afterwards.

XXXI. *Varniſh*

XXXI. *Varniſh to be laid on gilding and ſilvering.*

Grind verdigreaſe, on marble, with common water, in which you have infuſed ſaffron for eight hours.

XXXII. *The method of bronzing.*

Take three pennyworth of ſpal, one of litharge, a gill of lintſeed oil, and boil the whole to the conſiſtence of an unguent. Before you apply it, dilute the quantity you intend to make uſe of with turpentine oil, and lay a coat of vermilion on the work before bronzing.

XXXIII. *A water to gild iron with.*

1. Put in a glaſs bottle, with a pint of river water, one ounce of white copperas, and as much of white alum; two drachms of verdigreaſe, and the ſame quantity of common ſalt. Boil all together to the reduction of one half. Then ſtop the bottle well for fear the contents ſhould loſe their ſtrength.

2. To gild the iron with it, make it red hot in the fire, and plunge it in this liquor.

XXXIV. *To make the fine writing gold.*

1. Take gold in ſhell, and ſulphur, in the proportion of ten drachms of this, well grinded on porphyry and amalgamated, to every ſequin-worth of the other. Put this mixture into a proportionable leather bag, in which work it continually for the ſpace of two days, then pour all into a crucible, and burn it on a ſlow fire. This done, waſh what remains with filtered lime water, and by filtration alſo, get your water out again from the compoſition. If after this operation, you do not find it high enough yet in hue, waſh it again and again in the ſame manner, till it looks fine.

2. To apply it, dilute ſome bol armenian with iſinglaſs, and write what you pleaſe, and let it dry; then apply your gold, and when dry burniſh it.

XXXV. *How*

XXXV. *How to get the gold or silver out of gilt plates.*

1. Mix together one ounce of *aquafortis*, and one of spring water, with half an ounce of common, and one drachm of ammoniac salts. Put all on the fire, and boil it; then put in the plate to soak from which you want to get the gold or silver out. A little while after, take your plate out, and scrape it over the liquor.

2. The gold will remain suspended in this regal-water; and to make a separation of them, pour in it double the quantity of common water; or again, throw a halfpenny in it, and boil it, and all the gold will fix itself to it.

XXXVI. *To gild paper on the edge.*

1. Beat the white of an egg in three times its quantity of common water, and beat it till it is all come into a froth. Let it settle into water again, and lay a coat of it on the edge of your paper.

2. Next lay another of bol armenian and ammoniac salt, grinded with soap-suds. Then put the gold, and let it dry, before burnishing it.

XXXVII. *To gild on vellum.*

Mix some saffron in powder, with garlick juice. Put two or three coats of this on the vellum, and let it dry a little, but not quite. Then breathing on the coat, apply the gold leaf with cotton; and when dry, burnish it.

XXXVIII. *Another way.*

Lay first a coat of lime and burnt ivory, grinded together with a weak isinglass water. Apply the gold on it; and when dry, burnish it.

XXXIX. *Another way.*

Grind and mix together four ounces of bol armenian, one of aloes, and two of starch; dilute it in water, and lay a coat of it on the vellum, then the gold immediately. When all is dry, burnish it.

XL. *A gilt without gold.*

Take the juice from saffron flowers, in the season, or dry saffron in powder, with an equal quantity of yellow orpine well purified from its earthy particles. Grind all well together, and put it a digesting in hot horse dung for the space of three weeks. At the end of that term you may use it to gild whatever you like.

XLI. *To gild without gold.*

Open a hen's egg by one end, and get all out from the inside. Re-fill it again with chalidonia's juice and mercury; then stop it well with mastich, and put it under a hen which just begins to set. When the time of hatching is come, the composition will be done, and fit for gilding.

XLII. *To gild on calf and sheepskin.*

Wet the leather with whites of eggs. When dry, rub it with your hand, and a little olive oil; then put the gold leaf, and apply the hot iron on it. Whatever the hot iron shall not have touched will go off by brushing.

XLIII. *Gold and silver in shell.*

1. Take saltpetre, gum arabic, and gold leaves, and wash them all together in common water. The gold will sink to the bottom, whence pouring the water off you may then put it in the shell.

2. The silver is worked in the same manner, except the saltpetre, instead of which you put white salt.

XLIV. *To gild marble.*

Grind the finest bol armenian you can find with lintseed or nut oil. Of this you lay a coat on the marble, as a kind of gold size. When this is neither too fresh, nor too dry, apply the gold; and when thoroughly dry, burnish it.

XLV. *To apply gold on glazed wares, chrystal, glass, china, &c.*

Take a penny-worth of lintseed oil, and as much of gold

gold litharge; a halfpenny-worth of umber, and as much of ceruse. Grind all together on marble; and with a little hair pencil, dipped into the said colour, draw whatever you will on the abovementioned wares. As soon as dry, lay your gold on it with cotton, which p.ss along your cheek before taking the gold with it. And as soon as this is perfectly dry, burnish it.

XLVI. *Matt gold in oil.*

Take yellow ochre, a little umber, white and black lead, which grind all together with greasy oil, and use it when necessary.

XLVII. *To dye any metal, or stone, gold colour, without gold.*

Grind together in a subtile powder ammoniac salt, white vitriol, saltpetre, and verdigrease. Cover the metal, or stone you want to dye, all over with this powder. Set it thus covered, on the fire, and let it be there a full hour; then taking it out, plunge it in chamber-lye.

XLVIII. *To whiten copper.*

Take one ounce of zinc, one drachm and a third part of it of sublimed mercury. Grind all into powder, then rub with it what you want to whiten.

XLIX. *To whiten silver without the assistance of fire.*

Take *Mons martirum's* talo, which calcine well in an oven till it can be pulverised. Sift it very fine. Then dipping a piece of cloth or stuff in it, rub the silver with it.

L. *To whiten iron like silver.*

Mix ammoniac salt powder, and quick-lime, in cold water. Then make your iron red-hot several times, and each time, plunge it in that dissolution. It will turn as white as silver.

CHAP.

CHAP. VIII.

The Art of Dying Woods, Bones, &c.

I. *The compoſition for red.*

1. CHOP Braſil wood very fine, and boil it in common water, till it has acquired an agreeable colour; then ſtrain it through a cloth.

2. Give your wood firſt a coat of yellow, made of ſaffron, diluted in water. Then the wood being thus previouſly tinged with a pale yellow, and dried, give afterwards ſeveral coats of the Braſil wood water, till the hue pleaſes you.

3. When the laſt coat is dry, burniſh it with the burniſher, and lay another coat of drying varniſh with the palm of your hand; and you will have a red oranged very agreeable.

4. If you want a deeper red, or rather a darker, boil the Braſil wood in a water impregnated with a diſſolution of alum, or quick lime.

II. *Another red.*

Soak the chopped Braſil wood in oil of tartar; and with it rub your wood, proceeding for the reſt as above directed.

III. *Another way.*

Pound orchanetta into powder: mix it with oil of nut; make it lukewarm, and rub your wood with it. The reſt as above.

IV. *To*

IV. *To dye wood in a purpliſh colour.*

Soak Dutch turnſol in water; add a tincture of Braſil wood made in lime water; and you will obtain a purple, with which you may dye your wood, and then burniſh and varniſh as uſual.

V. *A blue purple.*

Take that ſort of German turnſol which painters uſe with ſize. Diſſolve it in water, and ſtrain it through a linen cloth. Give a coat of this dye to the wood; and if the hue be too ſtrong, give it another coat of a paler dye, by adding clear water to a part of the other. When dry, burniſh it as uſual.

VI. *Another.*

Four ounces of Braſil, and half a pound of India woods, boiled together in two quarts of water, with one ounce of common allum.

VII. *A blue for wood.*

Slack lime in water, and decant it out of the ground. In three pints of this water diſſolve four ounces of turnſol, and boil it one hour. Then give ſeveral coats of it to your wood.

VIII. *A green.*

Grind Spaniſh verdigreaſe into a ſubtil powder with ſtrong vinegar. Add and mix well with this, two ounces of green vitriol. Boil all of it a quarter of an hour in two quarts of water, and put your wood a-ſoaking till the colour be to your liking. For the reſt proceed as above.

IX. *A yellow.*

Diſſolve turnſol in two quarts of water. Then grind ſome indigo on marble with that water, and ſet it in a veſſel on the fire with weak ſize to dilute it. When done, give a coat of this dye to your wood with a bruſh, and when dry, poliſh it with the burniſher.

X. *Another*

X. *Another yellow.*

Boil in water ſome grinded *terra merita*, and ſoak your wood in it afterward.

XI. *Another finer yellow.*

Four ounces of French berries, boiled for about a quarter of an hour in a quart of water, with about the bulk of a filbert of roch-alum. Then ſoak the wood in it.

XII. *To dye wood in a fine poliſhed white.*

Take the fineſt Engliſh white chalk, and grind it in ſubtile powder on marble, then let it dry, and ſet it in a pipkin on the fire with a weak ſized water, having great care not to let it turn brown. When it is tolerably hot, give firſt a coat of ſize to your wood, and let it dry: then give one or two coats of the aforeſaid white over it. Theſe being dry alſo, poliſh with the ruſhes, and burniſh with the burniſher.

XIII. *To dye in poliſhed black.*

Grind lamp-black on marble with gum water. Put it next in a pipkin, and give a coat of this, with a bruſh, to your wood; then poliſh it when dry.

XIV. *Another way.*

Soak bits of ruſty iron in the beſt black ink. A few days after rub your wood with it, and when you ſee it well penetrated and dry, poliſh it with the burniſher.

XV. *To imitate ebony.*

Infuſe gall-nuts in vinegar, wherein you have ſoaked ruſty nails; then rub your wood with this; let it dry, poliſh and burniſh.

XVI. *Another way.*

Chuſe a good hard wood, and not veiny, ſuch as pear, apple, or hawthorn trees, and blacken them. When black,

black, rub them with a bit of cloth; then with a reed brush, made on purpose, dipped in melted wax, mixed in a pot with common black, rub your wood till it shines like ebony.

XVII. *Another way.*

Holly is a very fit sort of wood to take the dye of ebony. Form it first into the shape you intend to give it, then put it in a hatter's copper to boil, leave it till it has acquired a perfect degree of blackness. Then take off the filth of the dye, and polish it as you would ebony, with rushes, &c.

XVIII. *A fine black easily made.*

Take good ink, put it in a stone pan, new and well nealed, then set it in the sun to exsiccate it into a cake. When dry, take and scrape it out from the pan with a knife, and grind it into an impalpable powder on marble. This powder, diluted with varnish, will produce a fine black.

XIX. *To dye wood silver fashion.*

Pound tin glass, in a mortar, and reduce it into powder. Add water to it by degrees, till it comes into a liquid like liquor for painting. Put it in a clean pipkin, with size, and set it on the fire to warm. Brush your wood with this liquor; and when it is dry, burnish it.

XX. *To dye in gold, silver, or copper.*

Pound very fine, in a mortar, some roch-crystal with clear water. Set it to warm in a new pipkin with a little size, and give a coat of it on your wood with a brush. When dry, rub a piece of gold, silver, or copper, on the wood thus prepared, and it will assume the colour of such of these metals as you rub it with. After this is done, burnish it as usual.

XXI. *To give nut, or pear tree, what undulation you like.*

Slack some quick lime in chamber lye. Then with a brush

bruſh dipped in it form your undulations on the wood according to your fancy. And when dry, rub it well with a rind of pork.

XXII. *To imitate the root of nut-tree.*

Give ſeven or eight coats of ſize to your wood, till it remains ſhiny. Then before your ſize is quite dry, ſtrike here and there a confuſed quantity of ſpots with biſtre grinded with common water. When dry, varniſh it with the Chineſe varniſh.

XXIII. *To give a fine colour to the cherry tree wood.*

Take one ounce of orchanetta; cut it in two or three bits, and put it to ſoak for forty-eight hours in three ounces of good oil of olive. Then with this oil anoint your cherry-tree wood after it is worked and ſhaped as you intend it: it will give it a fine luſtre.

XXIV. *To marble wood.*

1. Give it a coat of black diluted in varniſh. Repeat it one, two, three, or as many times as you think proper; then poliſh it as uſual.

2. Dilute ſome white varniſh made with white gum, or ſhell-lac, and white ſandarac. Lay this white on the black ground, tracing with it what oddities you like. When dry, give a light rub with ruſhes, then wipe it, and give a laſt coat of fine tranſparent white varniſh, in order to preſerve the brightneſs. Let this dry at leiſure, then poliſh it.

XXV. *To imitate white marble.*

Break and calcine the fineſt white marble you can find; Grind it as fine as you poſſibly can, and dilute it with ſize. Lay two coats of this on your wood, which, when dry, poliſh and varniſh as before directed.

XXVI. *To imitate black marble.*

Burn ſome lamp black in a ſhovel, red hot, then grind it

it with brandy. For the bigneſs of an egg of black, put the ſize of a pea of lead in drops, as much of tallow, and the ſame quantity of ſoap. Grind and mix theſe together, then dilute it with a very weak ſize water. Give four coats of this; and, when dry, poliſh as uſual.

XXVII. *A counter faction of coral.*

1. Reduce goat's horns into a ſubtile powder. Put it in a clear lye made of lime and pearl aſhes. Let it there reſt for a fortnight. When reduced into a palp, add cinnabar in powder, or dragon's blood in tears, pulveriſed very fine, in what quantity you may judge neceſſary to give the quantity of matter you have got a fine and perfect coral hue.

2. Next boil this compoſition till it comes very thick; then take it off from the fire and mould it in moulds ſhaped in forms of coral. Or elſe caſt it again in what other ſorts of moulds you like, to make figures of it, and other ſorts of work, which will produce a fine effect.

Obſervation. This ſecret was worth immenſe ſums of money to him who found it out. The Turks paid them magnificently. But this branch of trade was ſoon put to an end by the cheats which were practiſed with the merchants of Tunis and Algiers.

XXVIII. *To take the impreſſion of any ſeal.*

1. Take half a pound of mercury; the ſame quantity of chryſtaline vitriol; as much verdigreaſe. Pulveriſe well theſe two laſt ingredients, and put them along with the firſt in a new iron pan, with ſmith's forge water. Stir all well with a wooden ſpatula, till the mercury is perfectly incorporated with the powders. Then waſh that paſte with cold water, and change it till it remains quite clear as when you put it in. Put the lump in the air, it will harden.

2. When you want to take the impreſſion of a ſeal with it, take it and place it over the fire on an iron plate. When there appears on it ſome drops like pearls, then it is hot enough; take it off and knead it in your hands with your fingers, it will become pliable like wax; ſmoothen

ſmoothen one ſide of it, and apply it on the ſeal, preſſing it to make it take the impreſſion. When done, lift it up, and ſet it in the air, where it will come again as hard as metal, and will ſerve you to ſeal the ſame letter, as the original ſeal itſelf, without any probability of diſcovering it, ſhould even the real one be laid on it.

XXIX. *Another way.*

Heat ſome mercury in a crucible, and ſilver filings in another, in the proportion of two parts of mercury to one of ſilver. As ſoon as the mercury begins to move, pour it on the ſilver filings. Let this cool, and then put it in a glaſs mortar. Pound it well with a peſtle of the ſame, and add a little water in which you have diſſolved ſome verdigreaſe. Stir this for three days, five or ſix times a day. Decant out the verdigreaſe water, and replace it with good vinegar, with which pound it again in the ſame mortar, as before, a couple of hours, changing vinegar as ſoon as it blackens. Pound it again, two other hours, with chamber lye inſtead of vinegar, changing it the ſame, during that time, as you did the vinegar.—Then take that matter, lay it on a waſh-leather ſkin, which bring up all round it, and tie it above with a ſtring. Preſs the lump well in that ſkin, ſo as to ſeparate and ſqueeze out all the ſuperfluous mercury which paſſes through the leather. And when none comes out any longer, open the ſkin, take the lump in your hand, and knead it, and ſmoothen one ſide of it to take the impreſſion you like, proceeding for the reſt, as above directed. It hardens in the air, and ſoftens with the heat of the hand, as you would do a piece of wax.

XXX. *To get birds with white feathers.*

Make a mixture of *ſemper-vivum-majus's* juice, and olive oil, and rub with it the eggs on which the hen is ſetting. All the birds which ſhall come from thoſe eggs will be white feathered.

XXXI. *To ſoften ivory.*

In three ounces of ſpirit of nitre, and fifteen of white wine,

wine, or even of mere ſpring water, mixed together, put your ivory a ſoaking. And, in three or four days, it will be ſo ſoft as to obey under the fingers.

XXXII. *To dye ivory thus ſoftened.*

1. Diſſolve, in ſpirit of wine, ſuch colour as you want to dye your ivory with. And when the ſpirit of wine ſhall be ſufficiently tinged with the colour you have put in, plunge your ivory in it, and leave it there till it is ſufficiently penetrated with it, and dyed inwardly. Then give that ivory what form you will.

2. To harden it afterwards, wrap it up in a ſheet of white paper, and cover it with decrepitated common ſalt, and the drieſt you can make it to be; in which ſituation leave it twenty-four hours.

XXXIII. *Another way to ſoften ivory.*

Cut a large root of *mandrake* into ſmall bits, and infuſe firſt, then boil it, in water. Put your ivory in this boiling liquor, and boil it too, till it is as ſoft as wax.

XXXIV. *To whiten ivory, which has been ſpoiled.*

Take roch-alum, diſſolve it in water, in a ſufficient quantity, to render the water all milky with it. Boil this liquor, and ſoak your ivory in it for about one hour, then rub it over with a little hair bruſh. When done, wrap it in a wet piece of linen to dry it leiſurely and gradually, otherwiſe it would certainly ſplit.

XXXV. *To whiten green ivory: and whiten again that which has turned of a brown yellow.*

1. Slack ſome lime into water, put your ivory in that water, after decanted from the ground, and boil it till it looks quite white.

2. To poliſh, ſet it on the turner's wheel, and after having worked it, take ruſhes and pumice-ſtone ſubtile powder with water, and rub it till it looks perfectly ſmooth. Next to that, heat it, by turning it againſt a piece of linen, or ſheeps-ſkin leather, and when hot, rub it over with a little whitening diluted in oil of olive, continuing

tinuing turning as before; then with a little dry whiten-ing, and a piece of ſoft white rag. When this is per-formed the ivory will look as white as ſnow.

XXXVI. *To petrify wood, &c.*

Take equal quantities of gem ſalt, roch-alum, white vinegar, calx, and pebbles powder. Mix all theſe in-gredients together, and there will happen an ebullition. If, after it is over, throw in this liquor any porous matter, and leave it there a-ſoaking for three, four, or five days, they will poſitively turn into petrifications.

XXXVII. *To imitate tortoiſeſhell with horn.*

Take one ounce of gold litharge, and half an ounce of quick lime. Grind all together, and mix it to the con-ſiſtence of pap, with a ſufficient quantity of chamber-lye. Put of this on the horn; and three or four hours after-wards it will be perfectly marked.

XXXVIII. *A preparation for the tortoiſeſhell.*

Make a mixture, as above, of quick lime, orpine, pearl aſhes, and *aquafortis*. Mixed well together, and put your horn or tortoiſeſhell a ſoaking in it.

XXXIX. *To dye bones, and mould them in all manner of ſhapes.*

1. Boil together twelve pounds of quick lime, and one of calcined roch-alum, in water, to the reduction of one third. Add, then, two more pounds of quick lime, and boil it again till it can carry an egg, without its ſinking to the bottom. Let it cool, then filter it.

2. Take twelve pounds of that liquor; half a pound of raſped Braſil wood, and four ounces of ſcarlet flocks; boil all about five minutes on a ſlow fire, then decant the cleareſt part of it, and put it by. Put on the *fæces* of Bra-ſil and ſcarlet about four pounds of the firſt water; boil it the ſame time as the other, and decant likewiſe the cleareſt part of it on the other. Repeat this operation,

till the new added water draws no more colour from the *fæces*.

3. Now raſp any quantity of bones, and boil them in clear lime water. Then take them out. Put them in a matraſs; and, over them, pour ſome of the tinged water, ſo as to ſoak them. Place the matraſs on a mild ſand bath, and evaporate the liquor. Add ſome more liquor, and evaporate it again, continuing to add and evaporate the tinged liquor, till the raſped bones are all turned into a ſoft paſte.

4. Take this paſte, and mould it as you like, in tin or other moulds, to make whatever thing or figure you want. Set it in the mould for a day or two, till it has acquired the ſhape you would have it; then, to harden it, boil it in a water of alum and ſaltpetre firſt, and afterwards in oil of nut. Theſe figures look inconteſtibly to be made of bones, without conceiving how they can be made ſuch, out of that matter, and in one ſolid piece.

XL. *To dye bones in black.*

Take ſix ounces of litharge, and the ſame quantity of quick lime. Boil all in common water, along with the bones. Keep ſtirring, till the water begins to boil. Then take it out, and never ceaſe ſtirring till the water is cold again: by that time the bones will be dyed black.

XLI. *To ſoften bones.*

Take equal parts of Roman vitriol and common ſalt. Diſtil the ſpirits out by the retort. If in the water you get from the diſtillation, you put the bones a ſoaking, they will become as ſoft as wax.

XLII. *To dye bones in green.*

Pound well together, in a quart of ſtrong vinegar, three ounces of verdigreaſe, as much of braſs filings, and a handful of rue. When done, put all in a glaſs veſſel, along with the bones you want to dye, and ſtop it well. Carry this into a cold cellar, leave it for a fortnight, the bones will be dyed green.

XLIII. *To*

XLIII. *A ſalt for hardening ſoft bones.*

Take equal quantities of ammoniac, common decrepitated and gem ſalts, as well as of *plumeum*, *ſaccarinum*, roch and ſhell alums. Pulveriſe, and mix all together; then put it in a glaſs veſſel well ſtopped, which bury in hot horſe dung, that the matter ſhould melt into water. Congeal it on warm embers. Then make it return into a *delequium* again, by means of the horſe dung, as before. When thus liquified for the ſecond time, it is fit for uſe. Keep it, to harden and conſolidate any thing, ſmear it over with it.

XLIV. *To make figures, or vaſes, with egg-ſhells.*

Put egg ſhells in a crucible, and place it in a potter's furnace, for two days, that they may there be perfectly calcined; then grind them dry into a ſubtile powder.

2. Next, with gum-arabic water and whites of eggs beaten together, make a liquor, with which knead that powder, and make a paſte or dough of it.

3. With that dough, to which give the conſiſtence of potter's clay, make and form whatever figure or vaſe you like, and ſet them in the ſun to dry.

XLV. *To dye bones and ivory of a fine red.*

1. Boil ſcarlet flocks in clear water aſſiſted with pearl aſhes, to draw the colour the better; then clarify it with roch-alum, and ſtrain this tincture through a piece of linen.

2. To dye, afterwards, any bones or ivory in red, you muſt rub them firſt with *aquafortis*, and then immediately with this tincture.

XLVI. *To make a paſte in imitation of black marble.*

Diſſolve two ounces of ſpalt on a gentle fire, in a glazed pipkin. When in perfect fuſion, add a third part of harabe, which muſt be ready melted, ſtir all together. When both are well mixed and united, take the pipkin

off the fire, and throw the contents, boiling hot, into a mould of a fine polish in the inside. When cold and dry, take the piece off from the mould, and you will find that nothing can imitate so well black marble as this deceptive composition.

XLVII. *To dye marble, or alabaster, blue or purple.*

1. Pound together in a marble mortar, parsnips and purple lilies, with a sufficient quantity of white wine vinegar. Proportion the quantity of parsnips and lilies to each other, according to the hue you wish to give the liquor. If you cannot get one of these two juices, make use of that you can get; and to every one pound of liquor, mixed and prepared, put one ounce of alum.

2. In this dye put your marble or alabaster, and boil them, supposing that they are not too considerable to go into the vessel with the liquor. And if they be, you must heat one part of it as much as you possibly can, then dye it with the liquor boiling hot, and thus proceed from place to place, till you have dyed it all over.

CHAP. IX.

CHAP. IX.

How to Caſt FIGURES in MOULDS.

I. *How to caſt figures in moulds.*

TAKE one pound of Paris-plaiſter, and an equal quantity of bricks, pounded into an impalpable powder; join to this one ounce of *alumen plumeum*, and one of ammoniac ſalt. Dilute all together, gradually, in clear water, without obſerving it, as you are to make a paſte of it; and make your moulds with it.

II. *To caſt a figure in bronze.*

1. Make a pattern with proper clay, mixed with ſand, to prevent its cracking, when it comes to dry.

2. When the pattern is completed mould it with plaiſter while it is ſtill damp, becauſe in drying, the parts of the pattern ſhrink, and loſe their fullneſs. To that effect begin by the bottom part of the figure, which cover with ſeveral pieces, and by rows; as for example, let us ſuppoſe the firſt row from the feet to the knees; the ſecond from the knees to the beginning of the belly; the third from the beginning of the belly up to the pit of the ſtomach, from thence to the ſhoulders, on which lay the laſt row, which is to contain the head.—Obſerve, however, that thoſe diviſions of rows admit of no particular rule, and ought to be intirely determined by, and adapted to the ſize of the figure. For when the pieces are made too conſiderable, the plaiſter works too much, and fatigues itſelf, which is detrimental to its taking a true and preciſe impreſſion of all the turns and ſhapes of the figure. So that at any rate, it is always preferable to make the pieces of the mould ſmaller than larger.

3. Obſerve, that if the figure you are moulding has got any draperies, or ornaments, which require a good deal of trouble and nicety, you cannot help making a great many ſmall parts and ſubdiviſions in your mould, in order to enable you to ſtrip them off the figure after-

wards with more facility. Fix little rings to affift in pulling them off more eafily, cover them all over with larger pieces, which contain feveral of the little ones.

4. When the mould is thus made and completed, you let it reft till it is perfectly dry. Then, before ufing it, they who are curious in their work do not content themfelves with imbibing it inwardly with oil, but they even make it drink as much wax as it can foak, by warming thofe feparate pieces, and putting wax in them to melt.—The motive in doing this is to render the wax-work, which is to be caft in it, finer and more perfect. For if you imbibe the mould with oil only, the wax figure caft in fuch a mould always comes out a little rough and like flour, becaufe the wax draws always the fuperficy of the plaifter, and in reverfe, the plaifter draws alfo the fuperficy of the wax, which produces a great defect in the figure, and is a great obftacle to its coming out from the mould with that neatnefs it otherwife fhould.

5. The mould being therefore thus imbibed with wax, if you want it for a bronze figure, you aflemble all the fmall parts of it each in their cafes, and with a brufh give them a coat of oil. Then, with another brufh, give them another coat of wax, prepared as follows.—Six pounds of wax, half a pound of hog's lard, and one pound of Burgundy pitch—This preparation of the wax, however, muft be regulated according to the country and the feafon. For in the heat of fummer, or hot climes, fuch as Spain, Italy, and France, wax may be ufed alone, as it keeps naturally foft, and the other drugs abovementioned, are added to it only to render it more tractable. Of this wax, whether prepared or natural, you lay another coat in the hollow of the mould, to the thicknefs of a fixpenny piece. Then, with wax made in flat cakes, of the thicknefs of a quarter of an inch, more or lefs, according to that you are willing to give your metal, you fill all the hollow parts of the mould in preffing hard this fort of wax in them with your fingers. When thus filled, you have an iron grate, larger by three or four inches every way than the plinth or bafis of the figure. On the middle of that grate you erect one or more iron bars, contoured agreeable to the latitude and

fituation

ſituation of the figure, and bored, from ſpace to ſpace, with holes to paſs other iron rods of the ſize and length neceſſary to ſupport the *core* (in French *ame* or *noyau*) of what you want to caſt.

6. Formerly they uſed to make their *cores* with potter's clay mixed with hair and horſe dung, well beaten together. With this compoſt, they formed a figure like the pattern; and, when they had well ſupported it with iron bars, length and croſs-ways, according to its poſition and attitude, they ſcraped it, that is to ſay, they diminiſhed, and took off from its bigneſs as much as they wanted to give to their metal. When that *core* was dry, they took the wax with which they had filled the hollow parts of their mould, and covered it with them.——This method is even practiſed now by ſome founders, eſpecially for great bronze figures, becauſe earth reſiſts better the power of that red-hot melted metal, than plaiſter can; and this they reſerve only for ſmall figures, and thoſe which are caſt in gold or ſilver. However, when plaiſter is well beaten and mixed with brick-duſt alſo well beaten and ſifted fine, it ſtands pretty well too. We ſhall therefore proceed on the method of caſting on plaiſter cores.

7. You take then the firſt, or bottom rows of the mould, filled by the laſt wax in cakes, as mentioned before, and aſſemble them on the iron grate round the principal iron bar, which is to ſupport the *core* when made. When they are joined together, you give them a tie round very hard with cords, leſt they ſhould vary from their poſition when you form the *core*.

8. To form this, as ſoon as the firſt ſet which completes the bottom row of the ſeparate pieces of the mould is fixed, you pour plaiſter, diluted very clear, and mixed, as we ſaid, with brick duſt, with which you fill up that bottom part of the hollow. Then, on this firſt bottom row of the mould, you place the ſecond in the ſame manner as the firſt; then fill it likewiſe with your prepared plaiſter. Thus you continue to erect your mould from row to row, till you come to the laſt, and fill it as you go, with plaiſter, which is called *forming the core*. If the figure require it, you paſs acroſs the core ſome iron

rods through the holes perforated for that purpoſe in the perpendicular bars, in order to ſupport the *core* the better, and give it more ſtrength and power to reſiſt the effort of the metal when it comes in fuſion upon it.

9. When all the pieces of the mould have been thus erected one upon another, and filled with plaiſter, you muſt ſtop a certain time to let it take a conſiſtence, then proceed, to take off the caſes and all the ſmaller parts of the mould contained in each of them, row by row, and one by one, in the ſame manner as you proceeded to erect them, with this difference, that in erecting them you begin at the bottom, and that in taking them off, you begun at the top; which, when done, leaves the figure to appear all in wax, covering the *core*, which is contained in the inſide of it.

10. You are then to proceed to repair the figure, and finiſh it after the original. The ſculptor, in that caſe, has even an opportunity of perfecting much ſome of the parts, in adding or taking off according as he thinks proper, to give more grace and expreſſion to certain ſtrokes, muſcles, or features only; as for the diſpoſition of the limbs, and their attitude, he can no longer mend or alter them.

11. The figure thus well prepared, you are to place what is called the *pouring* and the *vent holes*. The *pouring holes* are wax pipes of the bignefs of an inch diameter for ſuch figures as are of a natural ſize; for they are to be proportioned not only to the ſize of the figure, but even to that of the parts of that figure whereon they are placed. The *vent holes* are wax pipes likewiſe, but of a much leſſer ſize. Thoſe pipes are caſt in plaiſter moulds of what length you pleaſe, then cut to that of four or five inches, or thereabouts. They are caſt hollow, to the intent of rendering them lighter, otherwiſe they might as well be caſt ſolid. Thoſe which ſerve for pouring, are placed in a ſtraight perpendicular line, one above another, at ſix inches aſunder, and ſometimes nearer, when there are draperies, and much matter is uſed.

12. When the various pipes are placed and ſoldered againſt the fire, with wax, ſo that the end which is free ſhould be upwards, and as much perpendicular to the figure

figure as poſſible, you place another pipe of the ſame ſize quite perpendicular, which is to be fixed againſt every one of the ends of the others. All theſe pipes, both large and ſmall, ſerve for the pouring of the matter, and caſting of the figure. You are to place three or four of them generally round the figure, which is determined by its ſize, bulk, and diſpoſition.

13. But at the ſame time you are placing the pouring holes, you muſt not neglect placing alſo thoſe which are to ſerve for the vent. Theſe laſt are to be placed in the ſame line as and with the others, at the diſtance of four inches only from them, and fixed likewiſe by one end to the figure, and by the other to another long and perpendicular pipe, like thoſe for pouring. Now, as it is neceſſary that all the wax, when you come to melt it, ſhould, as we ſhall mention it in its place, come out entirely from the mould, you muſt not fail to place theſe ſorts of vent pipes on all the riſing and diſtant parts from the mean bulk of the figure, ſuch as the arms, fingers, draperies, &c. &c. from which the wax muſt be got out with facility, either by means of particular vent holes, ſo formed as to deſcend to the bottom of the figure, or by means of thoſe large ones placed perpendicularly alongſide of it —Obſerve, always, to make the pouring holes which come to the face and hands the ſmalleſt of any, that they may not affect too much the features and likeneſs, if any be intended, of thoſe parts; and that you may the more eaſily repair thoſe places with the chiſel, when they are finiſhed.

14. After theſe various pipes have been thus carefully fixed all about the figure, you muſt ſo place them that two of the main perpendicular ones ſhould join together at five or ſix inches higher, and above the upper part of it, and be terminated by a wax cup of four inches deep, and as much diameter, under, and at the bottom part of which you ſolder them. This cup ſerves as a funnel to receive the metal, and introduces it into the pouring holes, by means of its communication with them, to convey it afterwards into all the parts of the figure at once, and form it. Therefore, if there be four perpendicular aſcending

pipes, you make two ſuch cups, to communicate the metal to theſe pipes.

15. As for the vent holes, let them free above the top of the figure, and higher than the pouring ones, becauſe they want no cups.

16. When the wax figure is thus completely repaired and garniſhed, with all its pouring and vent holes, you prepare a compoſition of putty, and crucibles powder, well grinded, and ſifted very fine, which you dilute clear in a pan, like a colour for painting. With a bruſh take this compoſition, and cover all the figure, as well as the vent and pouring pipes. This operation you repeat ſeveral times, obſerving carefully to fill up all the cracks and crevices which may happen in drying. When the wax is thus perfectly covered every where, you put with the ſame bruſh, another compoſition thicker than the firſt, and of a ſtronger ſort.

17. This compoſition is made of the ſame materials as the other, but with this addition, that you mix ſome free earth along with it, and horſe-dung, quite clear from any ſtraw. After having given ſix or ſeven coats of this, you give another coat again, much thicker ſtill, of a ſtuff compoſed of nothing but free earth and horſe-dung, and this being dry, you give half-a-dozen more of the ſame, allowing time between each to dry. At laſt, you put with your hand, and no more with the bruſh, two other coats of this ſame laſt compoſition, of free earth and horſe-dung, mixed in form of mortar, obſerving always that the one ſhould be perfectly dry, before laying on the other; and that there ſhould be no part of the figure, whether naked or draperies, but what is equally covered with every one of the different coats we have mentioned.

18. Next to this, you muſt have flat iron bars turned and bent according to the diſpoſition of the figure, which being fixed by means of hooks at the ſides of the grate on which it ſtands, riſe up as high as the pipes, and joining cloſe to the mould, unite at top by means of a circle of iron which runs through all the hooks, by which theſe bars are terminated. Then you ſurround again the figure with

with other iron bars, made in form of hoops, to prevent the others which go from top to bottom, and to which they are fixed by means of wires, from giving way; and between every one of these bars, both perpendicular and horizontal, there must be no more than seven or eight inches distance allowed.

19. When all these bars are well fixed together, and enabled thereby to support and contain the mould, you take a compost of free earth, horse-dung and hair mixed together, in consistence of mortar, and with this you cover the mould and the bars all over, without attending any more to the shape of the figure, so that there appears no more but a shapeless lump of clay, which ought to be of about four or five inches thick.

20. When the mould is thus completed, you are to dig a square pit sufficiently deep for the top of the mould to be somewhat lower than the superfice of the ground where the pit is dug, and sufficiently wide also to allow room of a foot and a half, free all round the mould, when descended into it.—At the bottom of that pit, you construct a furnace, on the top of which there is to be a strong iron grate supported by the arches and wall of the furnace, which is to be made of stone or bricks, as well as the four sides of the pit from top to bottom.

21. After the grate is placed on the furnace, you descend the mould on it by means of engines. Then under the pipes which are to serve for pouring, as well as vent, you place pans to receive the wax which is to run off. This done, you light a middling fire to heat the figure, and all the place where it stands, with so moderate a heat, that the wax may melt without boiling, and come entirely out from the mould, without there remaining any part of it; which would not be the case if the heat be so great as to make it boil, for then it would stick to the mould, and cause defects in the figure, when you come to run the metal.—When therefore, you judge that all the wax is out, which you may know by weighing that you employed, and weighing it again after it is in the pans, you take these off, and stop the pipes, through which it came out, with clay. Then fill all the empty parts of the pit round the figure with

bricks, which you throw in gently, but without order; and when it is come up to the top, make a good brisk fire in the furnace. As the flame is interrupted by these bricks, it cannot ascend with violence, nor hurt the mould, and they only communicate their heat in going through all those bricks, which become so hot, that they and the mould are at last both red hot.

22. Twenty-four hours after the fire has been lighted, when you see that the bricks and the mould are equally red hot from top to bottom, you let the fire go out, and the mould cool, by taking all the bricks off. When there is no more heat at all, you throw some earth in the pit, to fill the place which had been occupied with the bricks; and in proportion as you throw it in, you tread it with your feet, and press it against the mould.

23. In order to melt the metal, you construct, just by the pit where the mould is, a furnace, the lower part of which ought to be higher by two or three inches than the top of the said pit, in order to obtain a sufficient declivity from it to the pit for the running of the metal. Its construction must be after the form of an oven, with good bricks and free earth, and supported by good and strong iron hoops. There is a border raised all round, so as to make it capable to contain all the metal which is intended to be melted in it. On the side which looks towards the pit, there is an opening, which is stopped during the melting of the metal, and from that opening comes an earthen funnel practised, which goes to a bason of good free earth placed over the mould, and the middle of which corresponds and communicates to those cups we have mentioned before. (No. 14.) This bason is called by the workmen *escheno*. And in order to prevent the metal from running into these cups, before the whole which is in the furnace is run into the *escheno*, there are men on purpose who hold a long iron rod terminated by one end in the form of these cups, and stop them.

24. When the metal is melted, you unstop the opening of the furnace in which it is contained; this runs into the *escheno*, and as soon as it is arrived, the men take off the rod with which they stopped the cups, and the mould being

being inſtantly filled all over, the figure is formed in one moment.

25. After the mould is thus filled with the metal, you let it ſtay in that ſituation for three or four days, then at leiſure, you take off the earth which had been thrown all round it, which helps the mould to become entirely cold. As ſoon as you are ſure there is no more heat, you break the mould, and the metal figure appears ſurrounded with rods of the ſame metal, ſtarting out from it, occaſioned by the vent and pouring holes, or pipes, through which the metal was introduced, and which remained filled with it. Theſe you muſt ſaw off, in order to unburden the figure of ſo much, and get it out of the pit more eaſily. Then you clean and ſcour with water and grinding-ſtone in powder, and pieces of deal or other ſort of ſoft wood, and you ſearch in all the hollow places of the draperies and other parts.

26. When the figures are ſmall, they are generally waſhed with *aquafortis*; and when it has operated, you may waſh them again with common water. When they are thus well cleanſed, you repair, finiſh, and fault thoſe which require to be treated more highly than others; for the large ones are ſeldom ſearched ſo minutely.

27. After they have been as much finiſhed as they are intended to be, you may give them, if you like, a colour, as ſome do, with oil and blood ſtone. Or, as ſome others practiſe it, you may make them turn green by means of vinegar. But without all that trouble, the bronze will in time take a natural varniſh of itſelf, and becomes of a blackiſh hue.

III. *How to gild ſuch ſorts of figures.*

1. They may be gilt two different ways; either with gold in ſhells, or with gold in leaves. The firſt method is the handſomeſt, and at the ſame time the moſt laſting, it being always uſed for ſmall ſized works. To apply it, you make a mixture of one part of the beſt gold, and ſeven of mercury, which founders call ſilver in that ſort of proceſs. When theſe are incorporated together, you then heat the figure, and rub it with the compoſition, which whitens

whitens it, and heating it again over the fire, the mercury exhales, and the figure remains gilt.

2. As for the other method, it is only for large sized works, and them on which one is not willing to make a great expence; you scrape the figure with small files, and other proper tools, make it quick and clean, then you heat and lay on a gold leaf, repeating this four times.

IV. *Of the choice and composition of metals.*

Any metal whatever may be used for the casting of figures, though the general composition runs as follows.

1. For the fine bronze figures, the alloy is half brass, half copper. The Egyptians, who are said to be the inventors of that art, used to employ two thirds of brass against one of copper.

2. Brass is made with copper and calamine. One hundred weight of calamine renders one hundred *per cent.* Calamine is a stone from which a yellow dye is drawn. It is to be found in France and at Leige.

3. Good copper ought to be beaten, not molten, when intended for statues. You must guard also against using putty, when in alloy with lead.

4. Copper may be forged either hot or cold. But brass breaks when cold, and suffers the hammer only when hot.

5. There is a sort of metallic stone called zinc, which comes from Egypt; it renders the copper of a much finer yellow than the calamine; but as it is both dearer and scarcer, they are not so ready to use it.

6. As for the composition for making of bells, it is twenty pounds weight of pewter for each hundred of copper. And the artillery pieces take but ten pounds only of pewter to one hundred of the other. This last composition is not good for the casting of figures, as it is both too hard and too brittle.

CHAP.

CHAP. X.

Secrets relative to the making of curious and useful Sorts of Ink.

I. *A good shining ink.*

1. PUT four quarts of warm water in a glazed pipkin. Add eight ounces of turpentine oil, and one pound of gall-nuts bruised in a mortar. Let the whole infuse thus for a week, then boil it gently, till with a pen you may draw a stroke yellow and shiny with it. Strain it through a strong cloth. Set it on a blasting fire, and as soon as it boils, add seven ounces of green vitriol to it, keep stirring it with a stick till it is perfectly dissolved. Let this rest for two days without disturbing it. There will be a skim on the top, which must be thrown off. Decant next the clearest part into another vessel, which you set on a gentle fire to evaporate about two fingers of the liquor, then let it rest four or five days, and it will be fit for use.

2. Rain water, or that in which walnuts have been infused, are both very good for making of ink.

3. With white wine, or old beer, you may likewise make very good shining ink.

4. A carp's gall is very proper to mix among it.

II. *To write on grease, and make the ink run on it.*

1. Cut a bullock's gall open into a pan, and put a handful of salt and about a quarter of a pint of vinegar to it, which you stir and mix well. Thus you may keep the gall for twelve months, without its corrupting.

2. When

2. When you are writing, and you find your paper or parchment greasy, put a drop of that gall among your ink in the ink-horn, and you will find no more difficulty to make your pen mark.

III. *An ink-stone, with which ink-stands may be made, and with which you may write without ink.*

Take gum arabic, fourteen ounces; lamp black, thirteen; and burnt willow wood coals, three. Pound the gum into an impalpable powder, and dissolve it into a pint of common water. This done, knead your above-mentioned powders with part of this gum water, so as to make a paste or dough of them, as it were for bread. With this dough form ink stands of the shape and form you like best, and in these ink stands, while the composition is still soft, you may stamp a few small holes.

2. This done, dry these stands in an ardent furnace for four hours, or in the shade, a sufficient time. When dry, brush them over with your aforementioned gum water, till they appear as black and shiny as jet, and as hard as marble.

3. When you want to use them, put a few drops of water in one of the holes, and put a pen to soak in it at the same time. If the water be but just put in, the ink will not be quite so black, but if it have remained a little while, it will be as black as the blackest of any inks.

IV. *To write with common clear water.*

Take gall nut powder, and vitriol calcined in the sun to whiteness, of each four ounces, and sandarak one and a half. All being pulverised and mixed, rub your paper with that powder; then steeping your pen in any common water, and writing with it, it will appear black like any other ink.

V. *A good ink both for drawing and writing.*

1. Bruise with a hammer one pound of gall nuts, and put it in to infuse for a fortnight in the sun, in two quarts of clear water, stirring it now and then. Strain this infusion through a sieve or a cloth in a glazed pipkin.

2. In

2. In another veſſel put two ounces of gum arabic, and half of the above infuſion. In the other half which remains to diſſolve two ounces and a half of German green vitriol, and let it infuſe for four and twenty hours. Join afterwards both infuſions together; and a week afterwards, or thereabouts, the ink will be very good, and fit for uſe.

VI. *To make very good ink without gall nuts; which will be equally good to waſh drawings and plans, and ſtrike very neat lines with the pen.*

1. In half a pound of honey put one yolk of an egg, and beat it a good while with a flat ſtick. Then aſperſe the matter over with three drachms of gum arabic in ſubtile powder. Let this ſtay about three days, during which, beat it often with a ſtick of walnut-tree wood.

2. Next to this, put to it ſuch a quantity of lamp-black as will make it in conſiſtence of a dough, which you make in cakes, and dry in the air, to render it portable.

3. When you want to uſe it, dilute it with water, or with a lye made either of vine wood aſhes, or walnut-tree, or oak, or even peach ſtones.

VII. *An inviſible ink.*

1. Diſſolve one ounce of ammoniac ſalt in a glaſs tumbler of water, and write. When you wiſh to make the writing appear, hold the paper to the fire, and it will become black.

2. The ſame may be done with the juice of an onion.

VIII. *Another way.*

Diſſolve ſome alum, and write with the liquor. Steep the paper in water, and the writing will appear white.

IX. *To make good India ink.*

Burn ſome lamp-black in a crucible till the fume which ariſes in doing it, has entirely ſubſided; grind it next on porphyry,

porphyry, or marble, with a pretty ſtrong water of gum tragacanth. Add an equal quantity of indigo burnt, and grinded in the ſame manner. Then mix them both together on the ſtone, and grind them for two hours. Gather up the compoſition, in a flat ſquare, of the height and thickneſs you are willing to give to your ſticks. Cut theſe with a knife to your intended ſize, and put them, if you chuſe, into an iron mould; and leſt the paſte ſhould ſtick to them, rub the inſide of the mould with lamp or ivory black, or with peach ſtones duſt, which you burn in a crucible ſtifled with a brick to ſtop it well.

X. *Red ink.*

Diſſolve half an ounce of gum arabic in three ounces of roſe water. Then with this water, dilute cinnabar, vermilion, or minium.

Ink of any colour may be made in the ſame manner, by ſubſtituting only a proper colouring ingredient to the aforementioned cinnabar, &c.

XI. *A green ink.*

Grind together verdigreaſe, ſaffron, rue juice, then dilute this paſte in the abovementioned gum roſe water.

XII. *To make an ink which appears and diſappears alternately.*

Write with an infuſion of gall nuts filtered through brown paper, and the writing will not be viſible. When you want to make it appear, ſteep a little ſponge, or bit of cotton, into an infuſion of vitriol, and paſs it over the written place of the paper; the writing will immediately appear. To rub it off, and make the paper look all white again, do the ſame with ſpirit of vitriol, and all the writing will be gone. To make it viſible again, rub the paper over with oil of tartar; and thus continue for ever.

XIII. *The*

XIII. *The invisible method of conveying secrets.*

1st. Ink.

Infuse for twenty-four hours, half an ounce of gold litharge in half a pint of distilled white wine vinegar, and shake the bottle often during the first twelve hours of the infusion. When all is well settled, decant the clear part into another phial, which you must stop carefully, and throw the fæces away.

If you have any secret to communicate to a friend, write it with this liquor, and it will be no more visible than if you wrote it with clear pump water.

XIV. *An ink to write over the other.* 2d. Ink.

Over the secret, written with the first invisible ink, you write any indifferent matter with the following composition.

Burn some corks in the fire; and when they are so thoroughly burnt as to blaze no more, put them into a bason, and soak them with brandy; then grind them into a paste, which, when you want to use, you dilute with distilled water, till it is fit to write with like any other ink.

XV. *Another ink which effaces the second, and makes the first appear.* 3d. Ink.

Dilute rose water and sorrel juice separately. Put half a pint of each together in a bottle, with two ounces of quick lime, and one of auripigment. Stir this well, now and then, and let it infuse during twenty-four hours, as you did the first. Decant the clear part, and throw the grounds away.

When you want to find out what was written with the first invisible ink, and which lies concealed under the second black one, steep a sponge into this present liquor, and passing quickly over every line; what was written in black vanishes at one stroke, and what was invisible appears in its stead as black, and as much effaceable as if written with common ink.

XVI. *An*

XVI. *An ink which will go off in ſix days.*

Write with willow-wood cinders, pulveriſed and diluted with common water.

XVII. *Another which you may rub off when you pleaſe.*

Dilute gunpowder in common water, and write with it on a piece of parchment; then when you want to efface it, take your handkerchief, and rub it off.

XVIII. *Powder ink.*

Take equal parts of black roſin, burnt peach, or apricot ſtones, vitriol and gall nuts, and two of gum arabic. Put the whole in powder, or in cake, as you like beſt.

XIX. *An exceeding good writing ink.*

1. Boil half a pound of India wood ſhavings in two quarts of good vinegar, to the reduction of one half. Take off the ſhavings, and ſubſtitute four ounces of gall-nuts bruiſed, and put all into a ſtrong bottle, which you expoſe in the ſun for three or four days, ſhaking it during that time three or four times a day. Then add a diſſolution of two ounces and a half of gum arabic in half a pint of either water or vinegar. Let the whole ſtand again in the ſun for a week, ſhaking it ſeveral times every day, during that term; ſtrain the liquor afterwards, and keep it for uſe.

2. If you ſhould want to render this ink ſhiny, you muſt diſſolve both the vitriol and gum arabic in an infuſion of Ind a wood, made as before directed, with the addition of one handful of pomgranate rinds in the bottle wherein the gall nut is.

3. If inſtead of ſetting this compoſition in the ſun, you ſhould boil it, it will take but a quarter of an hour a-doing. But it is never ſo good, and beſides, always turns muddy.

XX. *A*

XX. *A gold colour ink, without gold.*

Put half a drachm of saffron, one of auripigment, and one she-goat's, or five or six jack galls, in a glass bottle; and set it for a fortnight in hot horse dung. At the end of that term, add a gill of gum water, and place it again for the same length of time in horse dung. Then it is fit for use.

XXI. *Another way.*

Pulverise into an impalpable powder one ounce of orpine, and as much chrystal. Put this powder in five or six whites of eggs beaten, then turned into water. Mix all well, and it will be fit either to write or to paint in gold colour.

XXII. *To write in silver without silver.*

Mix so well one ounce of the finest pewter and two of quicksilver together, that both become quite fluid. Then grind it on porphyry with gum water, and write with it. All the writing will look then as if done with silver.

XXIII. *A good shining ink.*

Infuse for a day in a quart of good table beer half a pound of the blackest and most shiny gall nuts you can find. Add three ounces of gum arabic and half an ounce of brown sugar candy, with four ounces of green copperas. Then boil the whole in a glazed pipkin for about one hour, strain it through a cloth, and put it in the cellar to keep it for use.

XXIV. *A blue ink.*

Dilute half a pound of indigo with some flake white and sugar, in a sufficient quantity of gum water.

The same may be done with ultramarine, and gum water.

XXV. *A*

XXV. *A yellow ink.*

Dilute in gum water some saffron, or French berries, or gamboge, and you will have a yellow ink. The same may be done with any other colouring ingredient, to obtain an ink of the colour one likes to have.

XXVI. *A green ink, which may keep two years.*

Put a pint of water on the fire in a varnished pipkin; and when it is ready to boil, throw in two ounces of verdigrease pounded, and boil it gently on a slow fire for the space of half an hour, stirring it often during that time with a wooden spatula. Then add one ounce of white tartar, well pulverised, and boil it one quarter of an hour. Strain two or three times through a cloth, then set it before the fire to evaporate part of it, in order to make it more shiny. But observe, that the more it boils, the more it loses of its green colour, and approaches to the blue.

XXVII. *A shining ink.*

Put in a clean brass caldron six quarts of white wine, or beer, or rain water, with one pound of gall-nuts, and two ounces of roch-alum in powder, which you boil all together, to the reduction of one half. Take this liquor off from the fire, and strain it through a cloth into a glazed pipkin, and set it on the fire again for two hours longer. Then for the three or four following days, observe to stir it well only with a little stick, without boiling it at all; it will be fit for use. Whenever you use it, it will be very pale, but in twenty-four hours after, it will be as black as jet.

XXVIII. *A way of writing which will not be visible, unless you hold the paper to the sun, or to the light of a candle.*

Take flake white, or any other whitening, and dilute it in a water impregnated with gum adragant. If you write with this liquor, the writing will not be perceivable,

able, unleſs you apply the paper to the ſun, or the light of a candle. The reaſon why it is ſo, is, that the rays of light will not find the ſame facility to paſs through the letters formed with this liquor, as through the other parts of the paper.

XXIX. *A ſecret to revive old writings, which are almoſt defaced.*

Boil gall-nuts into wine; then ſteeping a ſponge into that liquor, and paſſing it on the lines of the old writing, all the letters which were almoſt undecypherable will appear as freſh as newly done.

XXX. *To write in gold or ſilver letters.*

Take gold or ſilver in ſhells, and dilute it with ſome gum arabic water. Then dip either a pen or a pencil in it, and write.

XXXI. *An iris on white paper.*

Boil in a new iron pot any quantity of ſublimate with common water, and a handful of ſmall nails. When the mercury begins to revivify, which happens after two or three hours boiling, throw the whole in a pan of cold water, half filled, and place it uncovered for one night, in a bog-houſe. Then the colours will ſwim on the top. Obſerve that the pan muſt be perforated at the loweſt part on one ſide, and ſtopped with a cork, or any other common thing; and that a ſheet of white paper muſt have been placed at the bottom of it, previous to the half filling it with the cold water, in which you are directed to throw the boiling compoſition. After this has been left in the bog-houſe the ſpace of one night, and the colours do ſwim on the top, unſtop the whole, and let the pan empty itſelf. Then the colours will ſettle, and fix themſelves on the ſheet of paper; and when this begins to dry, take it quite out of the pan, to finiſh drying it in the ſhade.

XXXII. *A*

XXXII. *A ſhining ink.*

1. In a quart of rain water ſettled, filtered and purified, infuſe for four or five hours, on a ſlow fire, one pound of gall-nuts, chuſing the ſmalleſt and blackeſt. Let them be previouſly bruiſed in a mortar, with ſome pomegranate rinds, and raſpings of fig-tree wood. Next to this make a lye of ſix ounces of Roman vitriol, and boil it in the ſpace of one hour at leaſt, ſtirring it with a ſtick of fig-tree wood; then let it reſt twelve hours, and ſift it.

2. On the ſame ground you may add the ſame quantity of water, and let it infuſe three days; then boil it, as above directed, with new copperas.

XXXIII. *A common ink.*

1. Bruiſe ſix ounces of gall-nuts, and as much gum arabic, and nine of green vitriol. Put them afterwards in three quarts at leaſt of river, ſpring or rain water. Stir the compoſition three or four times a day. And after ſeven days infuſion, ſtrain all through a cloth, your ink is made.

2. This ground, as well as that above, will admit of freſh water being put to it, with an addition of vitriol alſo.

XXXIV. *How to prepare printers ink.*

1. Take one pound of common turpentine, made with the ſandarak of the ancients, which is nothing elſe but juniper and lintſeed oil Add to it one ounce of roſin black, which is the ſmoke of it, and a ſufficient quantity of oil of nuts.

2. Set this compoſition on the fire, and boil it to a good conſiſtence. Such is the whole ſecret. Obſerve however, that in the ſummer it muſt boil a little more, and a little leſs in the winter. For in the ſummer the ink muſt be thicker, and thinner in the winter; becauſe the heat makes it more fluid. In which caſe it is therefore proper to boil it a little more, or to diminiſh the quantity of oil, allowed in the proportion to that of the turpentine.

XXXV. *The*

XXXV. *The preparation of the ink which ſerves to write inſcriptions, epitaphs, &c. on ſtones, marbles, &c.*

This ink is made with nothing elſe but a mixture of lintſeed oil b ack, and black pitch diſſo'ved over a ſmall fire. They call this alſo *ſtucco*.

XXXVI. *The various ways of making an ink for writing.* 1ſt. Method.

Put three ounces of gall-nuts, bruiſed on a ſtone, in thirty ounces of warm rain water. Let this be expoſed in the ſun for two days, after which time add two ounces of the fineſt green vitriol reduced into a ſubtile powder, and ſtir the liquor with a fig-tree ſtick. Let then the whole be expoſed for two days longer in the ſun again. Then put one ounce of gum-arabic, or cherry-tree gum, and ſet it in the ſun again for one day, after which boil it one bubble, and ſtrain it directly through a cloth. If too thick, add ſome water to it; if too thin, gum-arabic.

XXXVII. *Another way.* 2d. Method.

1. Take one pound of gall-nuts, and half a pound of gum-arabic, and as much of *liguſtrum* berries. Infuſe thi-, for a week, in three quarts of common water; then, by boiling, evaporiſe one quart of it or thereabouts. Then take it off from the fire, juſt boiling hot as it is, and throw in one pound of vitriol; ſtir well, and let it thus ſtand for a week or ten days. Strain it afterwards, and you will have a very fine ink.

2. You may add to this ſome pomegranate rinds, either whole, or bruiſed, but by no means in powder. Should it grow too thick, a little male chamber lye, vinegar, or roſe water, will thin it and give it a proper fluidity.

XXXVIII. *Another way.* 3d. Method.

Infuſe pomegranate rinds in well water: boil it to the diminution of one third. Then to every one pound of this infuſion add two ounces of green vitriol, and half an

ounce of gum-arabic in powder. Incorporate all on the fire, then you may ſtrain it, and keep it for uſe.

XXXIX. *Another way.* 4th. Method.

1. Some people have a very cheap way of making ink, with the liquor with which the curriers waſh their leather, to blacken it. To that liquor they only add a little vitriol and gum-arabic, and boil the whole one minute.

2. The currier's dye for leather is made with common or rain water, in which they boil thoſe little cups which carry the acorn on the oak tree.

XL. *Another way.* 5th. Method.

1. Bruiſe on a ſtone, ſome gall-nuts, and roaſt them in an iron pan with a little olive oil. Put one pound of ſuch gall-nuts, thus prepared, in a glazed pipkin. Pour over it white wine, ſo as to cover the gall-nuts over by four fingers breadth; then add half a pound of gum-arabic, and eight ounces of vitriol, both in powder. Set the whole in the ſun for ſome days, ſtirring often the compoſition with a ſtick, after which, boil it for a few minutes on a ſlow fire, then ſtrain and keep it.

2. On the fæces you may put again the ſame quantity as above of white-wine, boil and ſtrain it; and repeat it as long as the wine gets any tincture from the grounds.

XLI. *Another way.* 6th. Method.

There is again another very good method of making ink, which is this. In twenty ounces of white wine infuſe three of bruiſed gall-nuts; and, in thirteen other ounces of ſimilar white wine, diſſolve half a one of gum-arabic. Every day for a whole week, never fail to give ſeveral ſtirrings to the infuſion of gall-nuts, then ſtrain it, and add the diſſolution of gum, and mix with all two ounces of Roman vitriol. Now and then give a ſhake or two the bottle, and guard from letting it approach either the fire or the ſun. This compoſition will prove a very good ink.

XLII. *Another*

XLII. *Another way.* 7th. Method.

Take three ounces of gall nuts; new elm, or wild-aſh bark, and pomegranate dry rinds, equal quantities. Infuſe all in thirty ounces of white wine expoſed for ſix days in the ſun, and ſtir it ſeven times a day. Then add two ounces of gum-arabic, and one of Roman vitriol, which infuſe four days before ſtraining, and the ink is done.

XLIII. *Another way.* 8th. Method.

Take three ounces of gall-nuts, a handful of aſh-tree bark, two pounds and a half (or three pints) of white-wine, and mix all over a ſlow fire. When it begins to boil, take it off, and ſtrain it. Replace it on the fire till it begins to boil again; then take it off, and add two ounces of gum-arabic, and as much Roman vitriol. Stir with a ſtick for half an hour, then let it reſt for four days, taking great care that your liquor be well covered; then ſtrain it again, and keep it for uſe.

XLIV. *Another way.* 9th. Method.

Put in four pounds, or two quarts, of white wine, a glaſs of the beſt vinegar, and two ounces of bruiſed gall-nuts. Let this infuſe thus for four days, then boil away and evaporiſe one fourth part of it. Strain it, and add two ounces of gum-arabic in powder; mix well, and boil it for the ſpace of five minutes. Take it off from the fire, and add again three ounces of Roman vitriol, ſtirring it well till all is quite cold. Put it then into a glaſs bottle well ſtopped, and expoſe it for three days in the ſun. Then ſtrain the ink, when it will be fit for uſe.

XLV. *An ink which may be made inſtantly.*

Take gum arabic, and vitriol, of each one ounce; bruiſed gall nuts one and a half. Put all in ten ounces of white wine or vinegar; and, no longer than one hour after, you may uſe it.

XLVI. *Another way to the ſame purpoſe.*

Put in about eight ounces of the beſt white wine, half

an ounce of gall-nuts, as much gum-arabic, and eight drachms of Roman vitriol. Warm it a little on the fire, and the ink will inſtantly be done.

XLVII. *A portable ink, without either gall-nut or vitriol.*

1. Take one pound of honey, and two yolks of raw eggs. Dilute and mix them all well with the honey. Add three drachms of gum arabic in ſubtile powder. Stir well the whole together during three days, and ſeveral times a day, with a fig-tree ſtick flattened at one of the ends. Then, to that firſt compoſition add again as much of that ſort of lamp-black which is uſed in printers ink (*ſee* art. xxxiv. in this chap.) as may be required to thicken the whole into a lump, which you let dry, and keep in that ſtate.

2. When you want to uſe it, take a bit of it and dilute it in any common water, or lye, and it will write like any other ink.

XLVIII. *Another portable ink, in powder.*

This is made with equal quantities of gall-nuts and vitriol; a little gum-arabic and ſtill-leſs of ſandarak of the antients. You pound, or grind each drug well, and mix the powders together, which are to be very fine. Lay ſome of this compound powder on your paper, and ſpread it well with your fingers. Then dipping your pen into clear water you may write on this prepared paper, and it will appear as black as any other ink.

XLIX. *Another portable powder, to make ink inſtantly.*

Take and reduce into ſubtile powder ten ounces of gall-nuts, three of Roman vitriol, otherwiſe green copperas; with two ounces of roch-alum and as much of gum-arabic. Now when you want to make ink, put a little of this mixture into a glaſs of white wine, and it will inſtantly blacken, and be fit for uſe.

L. *Another ſort of powder to the ſame purpoſe.*

1. There is another method, by no means inferior to the

the others preceding, to make a powder fit for travellers, nay, which has the quality of mending any pale common ink, by giving it inſtantly a degree of conſiſtence, blackneſs, luſtre, and beauty, which it wanted before. To uſe this powder, you only diſſolve it in any liquor you like; ſuch as water, whether ſoft or ſalt, in wine or vinegar. Whether warm or cold, it does not ſignify much, though the warm is ſomewhat preferable. This curious powder is made as follows.

2. Take peach ſtones with their kernels in, put them in the fire till perfectly reduced into coals. Then take them off, and when they are quite dead and black, mix part of them with ſome lamp-black. Add two parts of bruiſed gall-nuts fried in oil and dried up: four parts of gum-arabic, all pulveriſed impalpably, and ſifted through a fine ſieve.

3. *Obſervation.* There is nothing which dyes ſo fine a black. It is alſo good for the human body; for, taken internally, it diſſipates all obſtructions, and promotes urine.

LI. *A yellow ink.*

Grind, on the ſame ſtone, ſome dry ſaffron, and an equal quantity of the fineſt orpine you can find, with carp's or jack's gall. Put all into a bottle, which you muſt ſtop well and place for ſome days in hot horſe dung. When you take it out you will find a fine gold colour ink.

Note. When the opportunity may be had, it is preferable to employ the juice extracted from freſh ſaffron flowers, that is to ſay, from the picked ſtaminas of that flower.

LII. *Another way.*

Some take the yellow ſuperficies of orange peels, and very pure flour of brimſtone, mixing all upon the ſtone, then put it in a glaſs bottle, which they ſet in the damp for ten days. Before uſing this it requires to be warmed, and the letters which are traced with it are not of a bad yellow.

LIII. *Another way.*

Chuſe the fineſt orpine, of a beautiful gold colour, ſhiny, ſhelly, and perfectly freed and purified of all its earthy particles. Mix it with an equal quantity of cryſtal perfectly grinded, and whites of eggs in a ſufficient quantity to make it ſo liquid as to admit of writing, drawing, and painting with it.

LIV. *Another ſort of yellow liquor.*

A certain golden diſtilled water may be made, with which gold letters could be traced. The proceſs is as follows. Put ſome orpine reduced into impalpable powder in roſemary water, drawn by diſtillation. Then diſtil it again, and the liquor which comes from it will be fit to write in gold letters.

LV. *Another way.*

1. Take two ounces of pewter, and melt it in a crucible. When melted add one of quickſilver, and mix it well with the pewter. Then put all on the ſtone, and grind it with one ounce of ſulphur. This compoſition will produce a very fine yellow powder.

2. To uſe it, diſſolve only what quantity you want in the white of an egg; and, whatever you trace with it will appear of a very good gold colour.

LVI. *Another way ſuperior to all the reſt.*

Of all the receipts which may be given for this purpoſe, none approaches the purpurine powder. Except gold itſelf, nothing can imitate it nearer; therefore this is the moſt eſteemed. True it is, it does not ſtand the injuries of the weather ſo well as real gold, nor laſts ſo long.—This powder is made with equal parts of pewter and quickſilver, or equal parts of ammoniac ſalt and ſulphur. And, to preſerve it, you keep it in little leathern bags.

LVII. *Of the uſe of ſugar-candy in ink.*

Sugar-candy has the admirable virtue of reſtoring bad ink

ink into good. It blackens it, renders it ſhiny, and makes it run properly. Therefore it is moſt adviſable to put ſome powder of white ſugar candy into the bottle or the ink-horn.

LVIII. *A ſort of black ink fit for painting figures, and to write upon ſtuffs, and linen, as well as on paper.*

Bruiſe on the ſtone one ounce of gall-nuts, and put it in a pint of ſtrong white-wine vinegar on the fire, with two ounces of iron filings. Evaporate away about one half of the liquor in boiling it gently, ſtrain the remainder, and keep it for uſe.

It would not be improper to add a little gum-arabic, to the above compoſition; however, it may as well be let alone.

LIX. *To prevent ink from freezing in the winter.*

If inſtead of water, you make uſe of brandy with the ſame ingredients which enter into the compoſition of any ink, that ink never will freeze. You may alſo put ſome into the ink already made otherwiſe, and it will aſſiſt a good deal in preventing the froſt from acting upon it.

LX. *How to renew old writings almoſt defaced.*

We ordered, *art.* xxix. of this chapter, to boil gall-nuts in wine: but we muſt add here that it is far preferable to infuſe them only twenty-four hours in it, then put all into a retort and diſtil. The liquor which comes from it being paſſed on the paper or parchment, will revive the defaced parts of the writings.

LXI. *A green ink.*

Take fine verdigreaſe, and dilute it with a mixture of diſtilled water of green gall-nuts and vinegar. Form it into drops ſuch as thoſe of confectioners. Dry them, and when you want to uſe them, dilute them into gum-arabic water.

LXII. *Another way.*

Take the ſtrongeſt white-wine vinegar, in which diſſolve verdigreaſe, rue juice, and a little roch-alum.

LXIII. *To write in gold letters, on iron or ſteel.*

1. Pound ſome gold marcaſites in a mortar; put it to infuſe twenty-four hours in vinegar, and boil it gently over the fire in a glazed pipkin, till the vinegar is almoſt vaniſhed away, which will take you nearly a whole day's time to boil. Then take the compoſition off from the fire, and after having left it to cool and dry a little more in the ſhade, put it in a retort, and diſtil.

2. With this liquor, write on iron or ſteel; the letters will appear black at firſt: but if, when dry, you rub over them with a piece of linen, they will turn gold colour.

LXIV. *An ink which writes like ſilver, without ſilver in it.*

1. Amalgamate equal parts of pewter and quickſilver, in the ſame manner as goldſmiths do; grind well that amalgamation on the ſtone.

2. If you dilute of this powder in gum-arabic water, and write with it, your letters will appear like ſilver.

LXV. *To write on ſilver in black which will never go off.*

Take burnt lead, and pulveriſe it. Incorporate it next with ſulphur and vinegar, to the conſiſtence of a painting colour, and write with it on any ſilver plate. Let it dry, then preſent it to the fire ſo as to heat a little the work, and all is done.

CHAP.

CHAP. XI.

SECRETS Relative to WINE.

I. *To make a wine to have the taſte and flavour of French muſcat.*

YOU have only to put in the caſk a little bag of alder flowers when the wine is juſt done preſſing, and while it boils ſtill. Then, a fortnight after, take out the bag.

II. *To make the* vin-doux.

When you caſk the wine, put in at the bottom of the caſk half a pound of muſtard ſeed, or a pound, if the caſk be double the common ſize.

III. *To make* vin-bourru, *of an excellent taſte.*

Take two quarts of wheat, which boil in two quarts of water till it is perfectly burſted. Stir it well, then ſtrain it through a fine cloth, ſqueezing a little the whole to get the creamy part out. Put two quarts of this liquor in a hogſhead of white wine, while it is ſtill a-boiling or in fermentation, with the addition of a little bag of dried alder flowers.

IV. *To imitate a* malvoiſie.

Take of the beſt galangal cloves and ginger, each one drachm. Bruiſe them coarſely, and infuſe for twenty-four hours, with brandy, in a well cloſed veſſel. Then take theſe drugs out, and having tied them in a linen bag,

let them hang in the caſk by the bung-hole. Three or four days after, your wine will taſte as good and as ſtrong as natural *malvoiſie*.

V. *To change red wine into white, and white into red.*

If you want to make red your white wine, throw into the caſk a bag of black vine-wood aſhes; and to whiten the red wine, you muſt put a bag of white vine-wood aſhes. Forty days after, take out the bag, ſhake the caſk, and let it ſettle again; then you will ſee the effect.

VI. *To prevent wine from* fuſſing, *otherwiſe taſting of the caſk, and to give it both a taſte and flavour quite agreeable.*

Stick a lemon with cloves as thick as it can hold; hang it by the bung hole in a bag over the wine in the caſk for three or four days, and ſtop it very carefully for fear of its turning dead, if it ſhould get air.

VII. *To make a vine produce a ſweet wine.*

One month before gathering the grapes, you muſt twiſt ſuch branches as are loaded with them, ſo as to interrupt the circulation of the ſap: then ſtrip the leaves off entirely, that the ſun may act with all its power on the grains, and, by diſſipating their ſuperfluous moiſture, procure a ſweetneſs to the liquor contained in them when they come to be preſſed.

VIII. *To make a ſweet wine of a very agreeable flavour, and beſides very wholeſome.*

Gather the grapes, and expoſe them for three whole days in the ſun. On the fourth day at noon put them under the preſs, and receive the firſt drop which runs of itſelf before preſſing. When this virgin drop ſhall have boiled, or fermented, put to every fifty quarts of it one ounce of Florentine-orrice in ſubtile powder. A few days after take it out clear from its lye, and then bottle it.

IX. *To clarify in two days new wine when muddy.*

Take a diſcretionable quantity of fine and thin beech ſhavings,

ſhavings, which put into a bag, and hang by the bung hole, in the caſk. Two days after, take out the bag; and if from red you want to make it white, you may do it by putting in the caſk a quart of very clear whey.

X. *To make the wine keep* mout *or* unfermented *for twelve months.*

Take the firſt, or virgin wine, which runs of itſelf from the grapes before preſſing; caſk and ſtop it well, then ſmear the caſk all over with tar, ſo that the water could not penetrate through any part of the wood into the wine. Plunge theſe caſks into a pond deep enough to cover them entirely with water, and leave them there for forty days. After which term you may take them out, and the wine contained in them will keep new for twelve months.

XI. *To make a wine turn black.*

Place in the cellar, wherein the wine is a-fermenting, two pewter pots, and it will turn black.

XII. *To clarify a wine which is turned.*

Take clean roch-alum in powder, half a pound; ſugar of roſes, as much; honey, whether ſkimmed or not, eight pounds, and a quart of good wine. Mix all well, and put it in a caſk of wine, ſtirring all as you pour it in. Take the bung off till the next day, then put it on again. Two or three days after this, it will be quite clear.

XIII. *To correct a bad flavour in wine.*

Put in a bag a handful of garden parſley, and let it hang by the bung-hole in the caſk, for one week at leaſt. Then take it out.

XIV. *To prevent wine from ſpoiling and turning.*

Mix in the caſk a tenth part of brandy, or half an ounce of oil of ſulphur.

XV. *To prevent thunder and lightening from hurting wine.*

Put on the bung a handful of ſteel filings and another of ſalt, tied up in a bag.

XVI. *To prevent wine from corrupting.*

Put to infuſe in the caſk a handful of gentian-root tied in a bag.

XVII. *To reſtore a wine turned ſour or ſharp.*

Fill a bag with leek-ſeed, or of leaves and twiſters of vine, and put either of them to infuſe in the caſk.

XVIII. *To reſtore a wine corrupted and glairy.*

Put in the wine cow's milk a little ſaltiſh; or elſe the rinds and ſhells of almonds tied up in a bag: or again, pine kernels.

XIX. *To prevent wine from growing ſour, and turning into vinegar.*

Hang by the bung hole, in the caſk, a piece of bacon, of about one pound and a half, and replace the bung. Or elſe throw into the wine a little bagful of aſhes of virgin vine.

XX. *To make a new wine taſte as an old wine.*

Take one ounce of melilot, and three of each of the following drugs, viz. liquorice and celtick nard, with two of hepatic aloes; grind and mix all well together, put it in a bag, and hang it in the wine.

XXI. *To reſtore a wine turned.*

Draw a pailful of it; or, take the ſame quantity of another good ſort, which boil, and throw boiling hot over that which is ſpoiled and ſinking; then ſtop the caſk quickly with its bung. A fortnight after taſte it, and you will find it as good as ever it was, or can be.

XXII. *To reſtore a wine* fuſted, *or taſting of the caſk.*

Draw that wine intirely out of its own lye, and put it in another caſk over a good lye. Then, through the bung hole, hang up a bag with four ounces of laurel berries

berries in powder, and a ſufficient quantity of ſteel filings at the bottom of the bag, to prevent its ſwimming on the top of the wine. And, in proportion as you draw a certain quantity of liquor, let down the bag.

XXIII. *To prevent wine from pricking.*

Put in the caſk half a pound of ſpirit of tartar. Or, elſe, when the wine is ſtill new and *mout*, throw in two ounces of common alum for every hogſhead.

XXIV. *To make wine keep.*

Extract the ſalt from the beſt vine branches; and of this put three ounces in every hogſhead at Martinmas, when the caſks are bunged up.

XXV. *To clarify wine eaſily.*

Put in the caſk two quarts of boiling milk, after having well ſkimmed it.

XXVI. *To prevent wine from turning.*

Put in the caſk one pound of hare's ſhot.

XXVII. *To correct a muſty taſte in wine.*

Knead a dough of the beſt wheat-flour, and make it in the form of a rolling pin, or a ſhort thick ſtick. Half bake it in the oven, and ſtick it all over with cloves. Replace it in the oven to finiſh baking it quite. Suſpend it in the caſk over the wine without touching it, and let it remain there; or elſe let it plunge in the wine for a few days, and take it quite out afterwards. It will correct any bad flavour the wine might have acquired.

XXVIII. *Another method.*

Take very ripe medlars, and open them in four quarters, without parting them aſunder. Then tie them with a thread, and fix them to the bung, ſo that by putting it in again they may hang and ſoak in the wine. One month

month afterwards take them out, and they will carry off all the bad taſte of the wine.

XXIX. *To correct a ſour, or bitter taſte in wine.*

Boil a quartern of barley in four quarts of water, to the reduction of two. Strain what remains through a cloth, and pour it in the caſk, ſtirring all together with a ſtick, without touching the lye.

XXX. *To reſtore a ſpoiled wine.*

Change the wine from its own lye, upon that of good wine. Pulveriſe three or four nutmegs, and as many dry orange peels, and throw them in. Stop well the bung, and let it ferment one fortnight. After that term is over, you will find it better than ever. This method has gone through many experiments.

XXXI. *To ſweeten a tart wine.*

Put in a hogſhead of ſuch a wine, a quarter of a pint of good wine vinegar, ſaturated with litharge; and it will ſoon loſe its tartneſs.

XXXII. *Another way.*

Boil a quantity of honey in order to get all the waxy part out of it, and ſtrain it through a double cloth. Of ſuch a honey thus prepared put two quarts to half a hogſhead of tart wine, and it will render it perfectly agreeable. If in the ſummer, and there be any danger of its turning, throw in a ſtone of quick lime.

XXXIII. *To prevent tartneſs in wine.*

Take, in the month of March, two baſonfuls of river ſand; and, after having dried it in the ſun, or in the oven, throw it in the caſk.

XXXIV. *To heighten a wine in liquor, and give it an agreeable flavour.*

Take two dozen or thereabouts of myrtle berries, very ripe.

ripe. Bruiſe them coarſely, after having dried them perfectly, and put them in a bag, which ſuſpend in the middle of the caſk. Then ſtop this well with its bung. A fortnight afterwards take off the bag, and you will have a very agreeable wine.

XXXV. *To give wine a moſt agreeable flavour.*

Take a pailful of *mout*, which boil and evaporate to the conſiſtence of honey. Then mix with it one ounce of Florentine orrice, cut in ſmall bits, and one drachm of *coſtus*. Put all into a bag, and let it down in the caſk by the bung-hole, after having previouſly drawn out a ſufficient quantity of wine to prevent the bag from coming at it. This bag being thus ſuſpended by a ſtring, which will hang out of the bung-hole, ſtop it well, and there will drop from the bag into the wine a liquor which will give it a moſt agreeable taſte.

XXXVI. *How to find out whether or not there be water mixed in a caſk of wine.*

Throw in the caſk one wild pear or apple. If either of theſe two fruits ſwim, it is a proof there is no water in the wine; for, if there be any, it will ſink.

XXXVII. *To ſeparate the water from wine.*

Put into the caſk a wick of cotton, which ſhould ſoak in the wine by one end, and come out of the caſk at the bung hole by the other; and every drop of water which may happen to be mixed with the wine, will ſtill out by that wick or filter.

You may again put ſome of this wine into a cup made of ivy wood; and then the water will perſpire through the pores of the cup, and the wine remain.

XXXVIII. *To ungreaſe wine in leſs than twenty-four hours.*

Take common ſalt, gum arabic, and vine bruſh aſhes, of each half an ounce. Tie all in a bag, and fix it to a hazel tree ſtick; then by the bung hole ſtir well the wine for one quarter of an hour, after which take it out,

and

and ſtop the caſk. The next day the wine will be as ſound as ever.

XXXIX. *To reſtore a wine.*

Put in the caſk one pound of Paris plaiſter. Then make a piece of ſteel red hot in the fire; and, by means of a wire fixed to one of its ends, introduce it by the bung-hole into the wine. Repeat this operation for five or ſix days running, as many times each day. Then, finally, throw into the wine a ſtick of brimſtone tied in a bag, which you take off two days after; and the wine will be perfectly well reſtored.

XL. *To correct a bad taſte and ſourneſs in wine.*

Put in a bag a root of wild horſe radiſh cut in bits. Let it down in the wine, and leave it there two days; take this out, and put another, repeating the ſame till the wine is perfectly reſtored.

XLI. *Another way.*

Fill a bag with wheat, and let it down in the wine; it will have the ſame effect.

XLII. *Another way.*

Put a drying in the oven, as ſoon as it is heated, one dozen of old walnuts; and, having taken them out along with the bread, thread them with a ſtring, and hang them in the wine, till it is reſtored to its good taſte; then take them out again.

XLIII. *To cure thoſe who are too much addicted to drink wine.*

Put, in a ſufficient quantity of wine, three or four large eels, which leave there till quite dead. Give that wine to drink to the perſon you want to reform, and he or ſhe will be ſo much diſguſted of wine, that though they formerly made much uſe of it, they will now have quite an averſion to it.

XLIV. *Another*

XLIV. *Another method, no leſs certain.*

Cut in the ſpring a branch of vine, in the time when the ſap aſcends moſt ſtrongly; and receive in a cup the liquor which runs from that branch. If you mix ſome of this liquor with wine, and give it to a man already drunk, he will never reliſh wine afterwards.

XLV. *To prevent one from getting intoxicated with drinking.*

Take white cabbages, and four pomegranate juices, two ounces of each, with one of vinegar. Boil all together for ſome time, to the conſiſtence of a ſyrup. Take one ounce of this before you are going to drink, and drink afterwards as much, and as long, as you pleaſe.

XLVI. *Another way.*

Eat five or ſix bitter almonds faſting; this will have the ſame effect.

XLVII. *Another way.*

It is affirmed, that if you eat mutton or goat's lungs, roaſted, cabbage, or any ſeed, or wormwood, it will abſolutely prevent the bad effects which reſult from the exceſs of drinking.

XLVIII. *Another way.*

You may undoubtedly prevent the accidents reſulting from hard drinking, if before dinner you eat, in ſallad, four or five tops of raw cabbages.

XLIX. *Another method.*

Take ſome ſwallows beaks, and burn them in a crucible. When perfectly calcined, grind them on a ſtone, and put ſome of that powder in a glaſs of wine, and drink it. Whatever wine you may drink to exceſs afterwards, it will have no effect upon you.

The whole body of the ſwallow, prepared in the ſame manner, will have the ſame effect.

L. *Another*

L. *Another way.*

Pound in a mortar the leaves of a peach-tree, and ſqueeze the juice of them in a baſon. Then, faſting, drink a full glaſs of that liquor, and take whatever exceſs of wine you will on that day, you will not be intoxicated.

LI. *A method of making people drunk, without endangering their health.*

Infuſe ſome aloe wood, which comes from India, in a glaſs of wine, and give it to drink. The perſon who drinks it will ſoon give ſigns of his intoxication.

LII. *Another way.*

Boil in water ſome mandrake bark, to a perfect redneſs of the water in which it is a boiling. Of that liquor, if you put in the wine, whoever drinks it will ſoon be drunk.

LIII. *To recover a perſon from intoxication.*

Make ſuch a perſon drink a glaſs of vinegar, or ſome cabbage juice, otherwiſe give him ſome honey. You may likewiſe meet with ſucceſs, by giving the patient a glaſs of wine quite warm to drink, or a diſh of ſtrong coffee, without milk or ſugar, adding to it a large tea-ſpoonful of ſalt.

LIV. *To prevent the breath from ſmelling of wine.*

Chew a root of *iris troglotida*, and no one can diſcover by your breath, whether you have been drinking wine or not.

LV. *To preſerve wine good to the laſt.*

Take a pint of the beſt ſpirit of wine, and put in it the bulk of your two fiſts of the ſecond peel of the alder-tree, which is green. After it has infuſed three days, or thereabouts, ſtrain the liquor through a cloth, and pour it into a hogſhead of wine. That wine will keep good for ten years, if you want it.

CHAP.

CHAP. XII.

Concerning the Compoſition of VINEGARS.

I. *To make good wine vinegar in a ſhort time.*

THROW ſome *Taxus* wood, or yew-tree, in any wine, and it will not be long before it turns into vinegar.

II. *To change wine into ſtrong vinegar.*

Take tartar, ginger, and long pepper, of each equal doſes. Infuſe all for one week in good ſtrong vinegar, then take it out, and let dry. And whenever you want to make vinegar, put a bag full of theſe drugs in wine; it will ſoon turn into vinegar.

III. *To make very good and ſtrong vinegar with the worſt of wines.*

Grind into ſubtile powder five pounds of crude tartar. Pour on it one pound of oil of vitriol. Wrap up the whole in a bag, tie it, and hang it by the bung-hole, in a caſk of bad and totally ſpoiled wine. Move and ſtir now and then that bag in the wine, and it will turn into very good vinegar.

IV. *To turn wine into vinegar in leſs than three hours.*

Put in the wine a red beet, and it will be quite ſour, and true vinegar, in leſs than three hours.

V. *To*

V. *To reſtore ſuch a wine to its firſt taſte.*

Take off the red beet, and in its ſtead put a cabbage root into that wine, and it will return to its primary taſte, in the ſame ſpace of time.

VI *An excellent preparation of vinegar.*

1. Take white cinnamon, long pepper, and *cyprus*, of each one ounce; round pepper, half an ounce; and two nutmegs. Pulveriſe each drug ſeparately, and put them in ſo many diſtinct bags. Put them in ſix different and ſeparate quarts of the beſt vinegar, and boil them two or three minutes.

2. Then boil ſeparately ſix quarts of good wine.

3. Seaſon a caſk, which is done by pouring a quart of the beſt vinegar into it, with which you rinſe it. Then pour in your boiled wine and vinegars, and fill half-way the caſk, with the worſt and moſt ſpoiled wine. Stop the caſk, and keep it till the vinegar is done. You may then draw from it, and refill the caſk with the ſame quantity of bad wine, as you take off vinegar.

VII. *To render vinegar alkali.*

Saturate any quantity of vinegar with ſalt of tartar.

VIII. *To make, in one hour, good roſe vinegar.*

Put a drachm of hare's marrow in a pint of wine, and you will ſee the conſequence.

IX. *Another method to make ſuch vinegar in an inſtant.*

1. Take common roſes, and unripe blackberries, which grow in hedges, of each four ounces, and of barberry fruits, one. Dry them all in the ſhade, and reduce them into ſubtile powder.

2. Mix two drachms only of this powder into a glaſs of white or red wine, then let it ſettle to the bottom, and ſtrain it through a cloth. It will be a very fine vinegar.

X. *To*

X. *To operate the same in one hour's time, on a larger quantity of wine.*

1. Take the best rye-flour, which dilute in the strongest vinegar, and make a thin round cake with it. Bake it quite dry in the oven; then pound it into a fine powder, with which and vinegar you make again another cake as before, and bake it also like the first. Reiterate this operation three or four times.

2. If you hang the last made cake in a cask of wine quite hot, you will turn the whole into vinegar in less than one hour.

XI. *The receipt of the vinegar, called the* Grand Constable's Vinegar.

Take one pound of damask raisins, and cure them of their stones. Put these raisins in a glazed jar, with two quarts of good rose vinegar. Let all infuse for one night over hot ashes; then boil it the next morning four or five minutes only. Take it off the fire and let it cool. Strain it through a cloth, and bottle it to keep for use, afterwards cork the bottle.

XII. *A secret to increase the strength and sharpness of the vinegar.*

Boil two quarts of good vinegar to the evaporation of one: then put it in a vessel, and set it in the sun for a week. Now if you mix this vinegar among six times as large a quantity of bad vinegar in a small cask, it will not only mend it, but make it both very strong and very agreeable.

XIII. *Another way to do the same.*

The root of *rubus idæus*; the leaves of wild pear-tree; acorns roasted in the fire; the liquor in which vetches (peas) have been boiled; horse chesnut powder put in a bag, *&c. &c.* add greatly to the sharpness of vinegar.

XIV. *The*

XIV. *The ſecret for making good vinegar, given by a vinegar-man at* Paris.

1. Pound coarſely, or rather bruiſe only, one ounce of long pepper, as much ginger, and the ſame quantity of *pyrethra*. Put theſe in a pan over the fire with ſix quarts of wine. Heat this only to whiteneſs, then put it in a ſmall caſk, and ſet it in the ſun, or over a baker's oven, or any other warm place.

2. Now and then add new wine in your caſk after having previouſly heated it as before, and let that quantity be no more than two or three quarts at a time, till the caſk is quite full.—If you add a few quarts of real vinegar, it will be the ſtronger.—Before caſking the wine, you muſt let it reſt in the pan in which it has boiled for two or three days.—A glazed earthen pan is therefore preferable to a copper one for boiling the wine in; for during the three days infuſion, the copper might communicate a dangerous quality of verdigreaſe to the vinegar.—When you put ſome vinegar, as beforementioned, to meliorate this compoſition, inſtead of wine, you muſt take care to heat it likewiſe over the fire, but not ſo much as the wine.—Let the caſk be well rinſed and perfectly clean, before putting the vinegar in.

3. The wild blackberries which grow among hedges are alſo very good to make vinegar, but they muſt be uſed while red, before they are ripe; then put them in the wine, and heat this to whiteneſs, and proceed in the ſame manner as you do with *pyrethra*, ginger, and long pepper.—The doſe of black berries is not determined; you may take any diſcretionable quantity of them, and the vinegar which reſults from theſe is very good.

XV. *To make vinegar with water.*

Put thirty or forty pounds of wild pears in a large tub, where you leave them three days to ferment. Then pour ſome water over them, and repeat this every day for a month. At the end of which it will make very good vinegar.

XVI. *To*

XVI. *To make good vinegar with ſpoiled wine.*

Put a large kettle-full of ſpoiled wine on the fire; boil and ſkim it. When waſted of a third, put it in a caſk wherein there is already ſome very good vinegar. Add a few handfuls of chervil over it in the caſk, and ſtop the veſſel perfectly cloſe. You will have very good vinegar in a very ſhort time.

XVII. *A dry portable vinegar, or the* vinaigre en poudre.

Waſh well half a pound of white tartar with warm water, then dry it, and pulveriſe it as fine as poſſible. Soak that powder with good ſharp vinegar, and dry it before the fire, or in the ſun. Reſoak it again as before with vinegar, and dry as above, repeating this operation a dozen of times. By theſe means you ſhall have a very good and ſharp powder, which turns water itſelf inſtantly into vinegar. It is very convenient to carry in the pocket, eſpecially when travelling.

CHAP.

CHAP. XIII.

SECRETS relative to LIQUORS and ESSENTIAL OILS.

1. *To make as good wine as* Spaniſh *wine.*

1. TAKE one hundred pounds weight of dry raiſins, from which pick off the ſtems, and open the fruit with a knife. Put theſe in a large wooden tub, very clean. Boil fifteen gallons of rain-water, purified by ſtraining through the filtering paper. Pour it over the raiſins, and cover it to preſerve the heat of the water. Twenty-four hours after take off the raiſins, which will be ſwelled, and pound them in a large marble mortar, then put them again in the tub. Heat fifteen gallons more of water, which pour over the other with the raiſins, and throw in twenty five pounds of coarſe ſugar. Stir all well, and cover the tub over with two blankets. Three days after, by a cock placed at the bottom of the tub, draw out all the liquor, and caſk it, adding ſix quarts of brandy to it. Preſs the ground with an apothecary's preſs, and put the juice in the caſk, with two pounds of white tartar pounded into a ſubtile powder, in order to promote the fermentation, and five or ſix ounces of polychreſt ſalt, and a knot of garden creſs ſeed, of about ſixteen or eighteen ounces weight, and another knot of ſeven pugils of alder flowers. Theſe knots are to be ſuſpended by a thread in a caſk.

2. If the wine look too yellow, you muſt ſtrain it through a jelly-bag, in which you ſhall put one pound of ſweet almonds pounded with milk. The older the wine, ſo much the better it is.

3. To

3. To make it red, diſſolve ſome cochineal pounded in a certain quantity of brandy, along with a little alum powder, in order to draw the better the dye of the cochineal, which put to digeſt on a ſand bath. Till the brandy has aſſumed a proper degree of colour, give it to your wine in a ſufficient degree.

4. It is preferable to clarify the ſugar well, and to put it in the caſk inſtead of the tub.

II. *Another way to imitate* Spaniſh *wine.*

Take ſix quarts of white wine; Narbonne honey, one pound; Spaniſh raiſins as much; coriander bruiſed, one drachm; coarſe ſugar, one pound. Put all in a kettle on a ſlow fire, and leave it there well covered, for three hours. Strain this through a jelly bag, then bottle and ſtop it well. Eight or ten days after it is fit for drinking.

III. *To make the* roſſolis.

1. Boil firſt ſome water, and let it cool till it is no more than lukewarm. Take next all the ſorts of fragrant flowers the ſeaſon can afford, and well picked, keeping none but the petals of each flower. Infuſe theſe, each ſeparately, in ſome of that lukewarm water, to extract their odorous ſmell, or fragrancy. Then take them off, and drain them.—Pour all theſe different waters in one pitcher; and to every three quarts of this mixture, put a quart or three pints of ſpirit of wine, three pounds of clarified ſugar, one quarter of a pint of eſſential oil of aniſe-ſeed, and an equal quantity of eſſential oil of cinnamon.

2. Should your *roſſolis* prove too ſweet and ſlimy in the mouth, add half a pint, or more, of ſpirit of wine.

3. If you think the eſſential oil of aniſe-ſeed ſhould whiten too much the *roſſolis*, mix it with the ſpirit of wine, before putting it in the mixed waters.

4. If you want to increaſe the fragrancy, add a few ſpoonfuls of eſſential oils of different flowers, with one pugil or two of muſk, prepared amber, and lump ſugar pulveriſed. Then ſtrain the *roſſolis* through a jelly bag

to clarify it, bottle and ſtop it well. Thus it may keep for ten years, and upwards.

IV. *To make a* roſſolis *which may ſerve as a foundation to other liquors.*

Put three quarts of brandy, and one of water, in a glazed earthen pot. Place this pot on a charcoal fire, adding a cruſt of bread and one ounce of aniſe-ſeed, and cover it till it boils. Then uncover it, and let it boil five minutes, and put in one pound of ſugar, or more if you chuſe. Now beat the white of an egg with a little of your liquor, take the pot off the fire, and throw in the white of an egg. Let this reſt thus for three days.

V. *To make* amborſy.

In the above preſcribed *roſſolis* water add three or four grains of paradiſe; as much cochineal pulveriſed; one clove; a little cinnamon and mace; ſix grains of coriander, and a quarter part of a lemon.

VI. *For the nectar.*

Add to the above *roſſolis* one quarter of an orange pounded; ſome orange flowers, and the upper pellicula of an orange pounded in a mortar, with lump ſugar in powder, and diluted with the fundamental *roſſolis* water above deſcribed.

VII. *A common* roſſolis.

Inſtead of one pound of ſugar, put only half a pound, and as much of honey.—To muſk it, put about fifteen grains of muſk, and as much of ambergris in powder, and pounded with ſugar, and mix it in the liquor.

VIII. *Another* roſſolis.

1. Take one pound and a half of the fineſt white bread, quite hot at coming out of the oven, and put it in a retort, with half an ounce of cloves bruiſed; green aniſe-

ſeed

ſeed and coriander, one ounce of each; a quart of good red wine, as much cow-milk; then lute well the receiver, and all the joints, with ſtarched paper. Let it dry for twenty-four hours, then diſtil the liquor by the heat of a *balneum mariæ*, and keep it.

2. Make next a ſyrup, with brandy or ſpirit of wine, which burn over lump ſugar pulveriſed in an earthen diſh or pan, ſtirring always with a ſpoon, till the flame has ſubſided. Then mix one drachm of ambergris with an equal quantity of ſugar; and having pulveriſed the whole, put it in a ſmall matraſs; pour over it one ounce of ſpirit of wine, and put all to digeſt for twenty-four hours on a *balneum mariæ*. There will then reſult a diſſolution which will congeal again in the cold.

3. To form your *roſſolis*, mix with your firſt compoſition, the abovementioned ſyrup of brandy, and the eſſence of amber.—If you want the *roſſolis* to be ſtronger, add ſome more ſpirit of wine to it, till it is as you deſire to have it.

IX. *Another way.*

Boil your ſyrup to conſiſtence after the common method. When done, add as much ſpirit of wine as you think proper, as well as of the abovementioned eſſence of amber, or any other ſort you pleaſe to prefer; and you will have as good *roſſolis* as that which comes from Turin.

X. *To make* Eau de Franchipane.

Put half a pound of ſugar in one quart of water; add a quarter of a pound of jeſſamine flowers, which infuſe for ſome time. When you find the liquor has acquired a ſufficient degree of fragrancy, ſtrain it through a jelly bag, and add a few drops of eſſential oil of ambergris.

XI. *Orange flower water made inſtantly.*

Put one handful of orange flowers in a quart of water, with a quarter of a pound of ſugar. Then beat the liquor by pouring it from one veſſel into another, till the water has acquired what degree of fragrancy you want it to have.

XII. *Muſcadine roſe water.*

Put two handfuls of muſcadine roſes in one quart of water, with one quarter of a pound of ſugar. For the reſt proceed as before.

XIII. *To make raſpberry, ſtrawberry, cherry, or other ſuch waters.*

1. Take the ripeſt raſpberries, ſtrain them through a linen cloth to expreſs all the juice out of them. Put this in a glaſs bottle uncorked, and ſet it in the ſun, in a ſtove, or before the fire, till cleared down. Then decant it gently into another bottle, without diſturbing the *fæces* which are at the bottom.

2. To half a pint of this juice, put a quart of common water, and a quarter of a pound of ſugar. Beat all together, by pouring backwards and forwards from one veſſel into another, ſtrain it through a linen cloth, and ſet it to cool in a pail of ice. It is a fine cooling draught in the ſummer.

3. Strawberries, cherries, *&c.* are done in the ſame manner.

XIV. *Lemonade water at a cheap rate.*

Diſſolve half a pound of ſugar in a quart of water; raſp over it the yellow part of one, two, or three lemons, as you like, and mix a few drops of eſſential oil of ſulphur in the liquor. Then cut three or four ſlices of lemon in the bowl, when you put the liquor in it.

XV. *Apricot water.*

Take a dozen of apricots very ripe. Peel and ſtone them. Boil a quart of water, then take it off from the fire and throw in your apricots. Half an hour after put in a quarter of a pound of lump ſugar, which being diſſolved, ſtrain all through a cloth, and put it to cool in ice as the others.

XVI. *To*

XVI. *To make exceeding good lemonade.*

On a quart of water put the juice of three lemons, or two only, if they be very juicy. Add ſeven or eight zeſts of them beſides, with one quarter of a pound of ſugar. When the ſugar is diſſolved, ſtrain the liquor, and cool it in ice as before-mentioned.

XVII. *To make orangeade the ſame way.*

You proceed with your oranges as with the lemons. If theſe be good, but little juicy, you muſt ſqueeze three or four oranges, with the addition of eight or ten zeſts. If you love odour, you may add ſome muſk and prepared amber.

XVIII. *To make* Eau de Verjus.*

Put on a quart of water three quarters of a pound of *Verjus* in grapes picked from the ſtalks. Squeeze it firſt in a marble or wooden mortar, without pounding it, for fear the ſtones ſhould give it a bitter taſte. After having put fruit, juice, and all in the water, handle it in the water, then ſtrain it to purge it from the coarſeſt grounds; add about five ounces of ſugar to the ſtrained liquor, or more if wanted, according to the ſourneſs of the fruit. As ſoon as the ſugar is diſſolved, paſs and repaſs it through the jelly-bag to clarify it; then cool it in ice, as uſual, for drinking.

XIX. *To make orgeat-water.*

Take one ounce of melon ſeed, with three ſweet and three bitter almonds. Pound all together in a marble mortar, adding a few drops of water to it while you pound, to prevent its turning into oil. Make all into a paſte with a peſtle in the mortar, then add a quarter of a pound of fine white lump ſugar in powder, which mix with the paſte. Dilute this in a quart of water, and after

* A ſort of ſour grape uſed in France as a fine acid in ſauces.

having mixed it well, ſtrain it through a flannel. Squeeze well the grounds in it till quite dry, add in the liquor ſeven or eight drops of eſſential oil of orange; and if you like it, a quarter of a pint of milk pure as from the cow. Put this to cool in ice, and ſhake the phial when you ſerve it in a glaſs to drink.

XX. *Other waters.*

The pigeon, the piſtachio, and the Spaniſh nut waters, are made in the very ſame manner; the milk and almonds of either ſorts, being only excepted.

XXI. *To make a cooling cinnamon water.*

Boil one quart of water in a glaſs veſſel before the fire. Then take it off and put in two or three cloves, and about half an ounce of whole cinnamon. Stop well the bottle, and when the water is cold, put half a pint only of it in two quarts of water with ſugar to your palate, a quarter of a pound is generally the proper quantity. When done, cool it, as uſual, in ice before ſerving.

XXII. *To make coriander water.*

Take a handful of coriander, which ſhell, and put in a quart of water half cooled again, after having boiled. Add one quarter of a pound of ſugar, and when the water has acquired a ſufficient degree of taſte, ſtrain, cool, and ſerve it as uſual.

XXIII. *Aniſe-ſeed water.*

The aniſe-ſeed water is made in the very ſame manner as the coriander water.

XXIV. *Citron water.*

Take a citron, which ſtrip of its peel, and cut in ſlices croſs-ways. Put theſe ſlices in a quart of water, with a quarter of a pound of ſugar. Beat well this water by pouring it backwards and forwards from one veſſel into another,

another, and when it has a ſufficient taſte of the citron, ſtrain it, &c.

XXV. *Cinnamon water.*

Bruiſe one pound of the fineſt cinnamon, and put it to infuſe for twenty-four hours in four pounds of diſtilled roſe-water, with half a pound or a pint of white wine, which put all together during that time in a glaſs matraſs on warm aſhes, and ſtop well the veſſel, ſo that it ſhould breathe no air. At the end of twenty-four hours increaſe the fire ſo as to procure a diſtillation, by putting the matraſs in the *balneum mariæ*, and keep this liquor in bottles well ſtopped.

XXVI. *To make cedrat water.*

Have a dozen of fine lemons, which ſplit into two parts. Take out all the kernels, and keep nothing but the pulp wherein the juice is contained. Put them in a new glazed earthen pan. Boil one pound of ſugar to the *plume* degree, then pour it in the pot over the lemons. Set this on a good charcoal fire, and boil it again till the ſugar comes to the *pearl* degree, and then bottle it.

XXVII. *To make cedrat another way.*

1. Squeeze the juice out of thirteen lemons, which ſtrain through a cloth, and put them aſide.—Then put two quarts and a half of water in a pan. In a piece of linen put three other lemons parted into quarters, which tie and ſuſpend in the water, then boil them till the water has entirely extracted the taſte of the lemons, and take them out.

2. In this water, thus prepared, put four pounds of ſugar, and make a ſyrup, which clarify according to art, with the white of an egg. When done, put in this ſyrup the juice of your thirteen lemons, and boil all together again to the conſiſtence of a ſyrup to the *pearl* degree, then bottle it.

3. When you want to uſe it, put four or five ounces of ſugar in a quart of water, and ſtrain it through a jelly bag, then put in a table ſpoonful or more of your ſyrup, beat, cool, and drink it.

XXVIII. *Juniper water.*

Put two pounds of juniper berries with two quarts of brandy in a ſtone bottle, which ſtop well, and place on hot aſhes to infuſe for twenty four hours. Strain the liquor, and add one pound of ſugar, half an ounce of cinnamon, as much cloves, a preſerved half peel of a whole lemon, and two pugils of aniſe ſeed. Theſe being put in the bottle, ſtop it well, and place it at two or three different times in a baker's oven, after the bread is out, and when you may bear your hand flat in it without burning.

XXIX. *To make good hydromel, otherwiſe metheglin.*

Take honey and water equal quantities in weight. Boil them together and ſkim the honey. When done ſufficiently you may know by putting an egg in, which muſt ſwim on the top. Pour then the liquor in a caſk wherein there has been ſpirit of wine or good brandy, well ſoaked with either, and ſtill wet with the ſpirit, and add two or three grains of ambergris. Stop well the caſk, and ſet it in the ſun during the dog-days. When it begins to ferment, unſtop the caſk to let the ſcum out, which ariſes like that of new wine. Obſerve during all that time not to ſtir the caſk. When the firſt fit of the fermentation has ſubſided, ſtop the caſk again, and the hydromel is fit for keeping.

Note. Inſtead of the ſun, you may, in other ſeaſons, make uſe of the top of a baker's oven, a ſtove, or a hot-houſe.

XXX. *To make* Eau d'Ange.

1. Take half a pound of the beſt cinnamon, and fifteen cloves, which pound into powder and put into a quart of water, with a nut-ſhell full of aniſe-ſeed, and infuſe

infuse for twenty-four hours, then boil on a charcoal fire, and strain.

2. If you want to make it stronger, you may, after it is cold, put what quantity you like of brandy, with a proportionable quantity of sugar.

XXXI. *Another* Eau d'Ange.

Put a quart of rose-water in a glass bottle with three ounces of benjamin, and half an ounce of storax in powder, which incorporate all together for four or five hours on a slow fire. Decant the liquor by inclination, and add to this *colatura* six grains of musk, and as many of grey amber.

XXXII. *Another* Eau d'Ange.

1. Take three pounds of rose water, three of orange, and two of melilot flowers; four ounces of benjamin, and two of storax; aloes, and *santalum citrinum*, one drachm of each; cinnamon and cloves, of each one; the bulk of a bean of *calamus aromatica*, with four grains of musk. Bruise coarsely what may be susceptible of the mortar, and then put all the drugs together in a varnished earthen pan, which set on a gentle fire to boil moderately to the evaporation of one third. Then strain it clear.

2. With the grounds you may make lozenges, with a little gum adragant to compact them.—This ground is used also in making musk vinegar.

XXXIII. *A light and delicate* rossolis, *known under the denomination of* populo.

1. Boil three quarts of water, then let them cool again. Add one quart of spirit of wine, one of clarified sugar, half a glass of essential oil of cinnamon, and a very little of musk and ambergris.

2. Observe the sugar should not be boiled too much in clarifying, for fear it should crystalize when in the *rossolis*, and cause clouds in it. Observe also to boil the water

firſt, as preſcribed before uſing it, to prevent the corrupting of the liquor; which would infallibly be the caſe were you to employ it unboiled.

XXXIV. *Anglic water.*

1. Take half an ounce of angelica, as much cinnamon, a quarter part of cloves, the ſame quantity of mace, of coriander, and of green aniſe-ſeed, with half an ounce of cedar-wood. Bruiſe all theſe ingredients in a mortar, and ſet them to infuſe for twelve hours, with two quarts of genuine brandy, in a matraſs or retort. Then diſtil the liquor by *balneum mariæ*.

2. Two or three ounces only of this eſſential ſpirit in two quarts of brandy, with the addition of a very ſmall quantity of muſk and ambergris, will make a very agreeable liquor.

XXXV. *The preparation of muſk and amber, to have it ready when wanted to put in cordials.*

Put in a mortar and pulveriſe four grains of amber, two of muſk, and two ounces of ſugar. Wrap this powder up in a paper, and cover it over with ſeveral others. —With this powder you may perfume ſuch cordials as require it.—The doſe is a pugil, taken with the point of a knife, ſhake lightly in it. You may however increaſe or diminiſh this doſe, according to your liking.

XXXVI. *To make* Eau-de-Cete.

To three quarts of boiled water, cooled again, put a gill of eſſential ſpirit of aniſe-ſeed mixed into three pints of ſpirit of wine. Add one pint, or thereabouts, of clarified ſugar.

XXXVII. *To make the compounded* Eau-clairette.

Take ſix pounds of the beſt and fineſt Kentiſh cherries very ripe, ſound and without ſpots; two of raſpberry; and the ſame quantity of red currants, ripe and ſound, and

and without ſtalks. Maſh the whole in a ſieve over a pan. To every one quart of that juice put one of brandy, with three quarters of a pound of ſugar, ſeven or eight cloves, as many grains of white pepper, a few leaves of mace, and a pugil of coriander, the whole coarſely bruiſed in a mortar.—Infuſe all theſe together, well ſtopped, for two or three days, ſhaking it now and then, to accelerate the diſſolution of the ſugar. Then ſtrain the liquor, firſt through the jelly-bag, next filter it through the paper, and bottle it to keep for uſe.

XXXVIII. *The cinnamon water.*

In three quarts of once boiled water, and then cooled again, put half a pint of eſſential ſpirit of cinnamon, diſtilled like that of aniſe-ſeed. Add three pints of ſpirit of wine, and one of clarified ſugar. Strain all through the jelly-bag, *&c. &c.*

XXXIX. *Strong aniſe-ſeed water, or animated brandy.*

Put half a pint of eſſential ſpirit of aniſe-ſeed, into three quarts of the beſt genuine brandy, with one of boiled water.—If you want it ſweet, add clarified ſugar. Strain all through the jelly-bag, *&c. &c.*

XL. *To make white* Ratafia, *called otherwiſe* Eau-de-Noaiu, *or kernel water.*

Pound three quarters of a pound of cherry-ſtones, wood and kernels, or almonds, in a ſtone pitcher, with twelve quarts of brandy. Add one drachm of cinnamon, a dozen of cloves, two pugils of coriander, and three pounds and a half of ſugar. Let all theſe infuſe together, till ſufficiently taſty, and ready to ſtrain, add four quarts of water that has been boiled and is cool again. Then run it through the jelly-bag, and next through the filtering paper; bottle and ſtop it for uſe.

XLI. Hypocras, *both the red and white sort.*

1. Take two quarts, more or less, of the best wine, whether red or white. Put in one pound of the best double refined lump sugar, two juicy lemons, seven or eight zests of Seville orange, with the juice squeezed out of another of the same sort. Add half a drachm of cinnamon bruised in a mortar, four cloves broken into two parts, one or two leaves of mace, five or six grains of white pepper bruised, half of a *capsicum*'s pod, and one ounce of coriander bruised, half a pint of genuine cow milk, a golden pippin, peeled and cut in slices.

2. Stir well these ingredients together in your wine, and let it rest twenty four hours. Then obtain the liquor through the flannel bag, repeating the same till it comes clear.

3. If you want to perfume that *Hypocras*, you must put in the bag when you run it, a little pugil of musk and amber powder prepared; as mentioned in this chapter, Art. xxxv. This may keep for a twelvemonth, without spoiling.

XLII. *To make good* rossolis.

Dissolve one pound and a quarter of sugar, in half a pint of spirit of wine. Boil it to give an opportunity of skimming it. When done, put it in a large glass bottle, with three pints of good white wine, and a gill of orange-flower water. Musk and amber it as usual, and at your liking.

XLIII. *An essence of* hypocras, *to make this liquor instantly, and at will.*

1. Put in a pint bottle one ounce of cinnamon; a little more than half an ounce of cloves; and, on the point of a knife, a little musk and amber, prepared as in Art. xxxv. Fill it half way with the best brandy; then stop it that nothing can evaporate. Set all to infuse for seven or eight days on warm ashes. And, when it shall have wasted two thirds, or thereabouts, preserve carefully what shall remain.

2. When

2. When you want to make *hypocras* inſtantly, melt half a pound of lump ſugar in a quart of good wine; and, when perfectly diſſolved, let fall one drop or two of the above prepared eſſence, in a clean glaſs decanter, in which pour directly the wine with the ſugar diſſolved in it, then run it through the flannel bag. Bottle it again, or drink it.

XLIV. *An exceeding good* Ratafia.

On a quart of good brandy, put half a pint of cherry juice, as much of currants, and the ſame of raſpberries. Add a few cloves, a pugil of white pepper in grain, two of green coriander, and a ſtick or two of cinnamon. Then pound the ſtones of the cherries, and put them in, wood and altogether. Add a few kernels of apricots, thirty or forty are ſufficient. Stop well the pitcher, which muſt be a new one, after all theſe ingredients are in, let the whole infuſe a couple of months in the ſhade, ſhaking twice or thrice during that ſpace of time, at the end of which run the liquor through the flannel bag, and next through the filtering paper, then bottle and ſtop it well for uſe.

Note. In increaſing in due proportion the quantity of the brandy, and the doſes of each of the ingredients preſcribed, you may make what quantity you like of this *Ratafia.*

XLV. *An eſſence of ambergris.*

Pound one drachm of ambergris, and put it on a pint of good ſpirit of wine, in a thick and green glaſs bottle. Add to it half a drachm of muſk in bladder, cut very ſmall. Set this bottle in the full South ſun, on gravel, during the dog-days, taking it off every night, and during rainy weather. Stir and ſhake well the bottle, and its contents, two or three times a day, when the ſun ſtrikes on the bottle, that the amber may diffuſe in the liquor. One month after, take off the bottle from its expoſition, and the eſſence is made.—Decant, bottle, and ſtop it for uſe.

XLVI. *Another,*

XLVI. *Another, and ſhorter way of making the ſame.*

Put two grains of ambergris, and three of muſk, in a matraſs, with one gill and a half of good brandy. Stop the matraſs well, and put it in digeſtion in a *balneo mariæ*, for two or three days. Strain it through a piece of flannel, and bottle it to keep for uſe.

XLVII. *A ſmelling water.*

1. Put in any quantity of brandy, benjamin, and ſtorax calamite, equal parts; a little cloves and mace, coarſely bruiſed. Set this a digeſting for five or ſix days on warm aſhes. When the liquor is tinged of a fine red, decant it gently from the reſidue in a glaſs bottle, and throw in a few grains of muſk, before ſtopping it.

2. Three drops of this ſmelling water in a common glaſs tumbler of water, give it a very agreeable fragrance.

3. With the ground, or reſidue, you may make lozenges, in adding a little gum-adragant to bind them.

XLVIII. *A receipt to compoſe* one pint *of* roſſolis, *with which you can make forty.*

1. Take two ounces of galanga; half a one of cinnamon; as much cloves; one of coriander; a pennyworth of green aniſe-ſeed; half an ounce of ginger; two drachms of mace, and two of Florentine orrice. Bruiſe all, and put it to infuſe with three pints of the beſt brandy, in a matraſs with a long neck. Adapt it to the receiver, and lute well all the joints, both of the receiver, and the bolt-head, with paper and ſtarch.

2. Twelve hours after it has been a digeſting, diſtil the liquor by the heat of a very gentle *balneum mariæ*, till you have got about one quart of diſtilled ſpirit.—Then unlute the receiver and keep the liquor.

3. You may adapt another receiver, or the ſame again, after being emptied, lute it, and continue to diſtil as before. But what will come will be infinitely weaker, though perhaps not altogether very indifferent.

XLIX. *To*

XLIX. *To make a* roſſolis *after that of* Turin.

Take ſix quarts of water, which boil alone, one minute or two; then put in four pounds of fine lump ſugar, which ſkim and clarify with the white of an egg beaten up with a little cold water. Boil afterwards that ſirup to the waſting of a third, then ſtrain through the flannel bag; and, when cold, put in one gill only of the above *roſſolis*, preſcribed in Art. xlviii. *and of the firſt diſtillation*. Add to it beſides a pint of ſpirit of wine, or for want of it, of the beſt genuine French brandy, in which you ſhall have put a cruſt of bread burnt, to take off a certain bitter taſte. After all this, perfume the liquor with a few drops of eſſence of muſk and amber.

Note. A pint of the *ſecond diſtillation* is no more than half a pint of the *firſt*.

L. *How to make a* Sherbet, *a Perſian ſpecies of punch.*

There are various ways of making ſherbet—Some make punch here with rum only, others with brandy; others again with arrack, and others with ſhrub. Some will have it mixed with two of theſe ſpirits, and others will make it with white wine. There are ſome who put acids, others do not; and among the acids, ſome chuſe tartar only, others lemons, and others *Seville* oranges; ſome again ſqueeze a little of each of theſe two laſt tart fruits together in the ſame bowl of punch.

It is the ſame with reſpect to ſherbet, the famous *Perſian* drink. They make it with the various ſirups extracted from all the odoriferous flowers; and the doſe is, one part of ſuch a ſirup to ten parts of any ſpirituous liquor—Or again, they make a weak *roſſolis*, with the zeſts of oranges and lemons boiled together in water with ſugar. —Some, in ſhort, will make it with the eſſential ſpiri of muſk and amber only, put in boiling water with ſugar, juſt as we do our punch.

LI. *An*

LI. *An exceeding fine essence of* Hypocras.

1. Take six ounces of cinnamon; two of *santalum citrinum*; one of galanga; one of cloves; two drachms of white pepper; one ounce of grains of paradise. Or, if you would not have it so strong, put with the cinnamon and *santalum* one ounce only of white *d Æamum* and four whole grains of long-pepper. Pound well altogether, and set it to infuse for five or six days in a matrass, along with half a pint of spirit of wine, on warm ashes. Decant it next gently, without disturbing the grounds, which put in linen, and squeeze it, to get out all the liquor, which put again in the matrass, with twenty grains of ambergris, and six of musk. Stop well the vessel, and set it in a cool place for five or six days more; then mix both liquors together, and filter them.

2. When you want to make *hypocras*, dissolve half a pound of fine lump sugar, in a quart of white *Lisbon*, or red claret, and let fall fifteen or sixteen drops of the above essence in it, then shake all well together, and you will have a most admirable liquor. To render it still more agreeable, you may strain it through a flannel bag, at the bottom of which you shall have put some pounded almonds.

LII. *To make* Vin des-Dieux.

Peel two large lemons, and cut them in slices; do the same with two large golden pippins. Put all a soaking in a pan with a pint of good *Burgundy*, three quarters of a pound of lump sugar in powder, six cloves, and half a gill of orange flower water. Cover the pan, and keep it thus for two or three hours, then strain the liquor through the flannel bag. You may musk and amber it, like the *hypocras*, if you will.

LIII. *Burnt wine.*

Put a quart of good *Burgundy* in an open pan, with one pound of sugar, two leaves of mace, a little long pepper, a dozen of cloves, two or three tops of rosemary branches,

branches, and two bay-leaves. Place that in the middle of a wheel-fire of blaſting charcoal. When the wine begins to be hot, ſet the fire to it with a bit of paper, and thus let it kindle and blaze till it goes out of itſelf. This wine is drank quite hot, and it is an admirable drink, eſpecially when the weather is very cold.

LIV. *To imitate muſcat wine.*

In a caſk of new white wine (that is to ſay, before it has worked) introduce, by the bung-hole, five or ſix tops of alder flowers dried up. Let theſe flowers hang by a ſtring, and eight or ten days after take them out again. You will obtain a wine which will not differ from muſcat.

LV. Eau-clairette *ſimple.*

Infuſe for twenty-four hours three ounces of cinnamon bruiſed in three pints of brandy. Strain it afterwards through a clean cloth, and add two ounces of good lump ſugar, with a pint of roſe water. Stop well the bottle, and keep it for uſe.

LVI. *A violet water.*

Infuſe ſome violets in cold brandy. When theſe have loſt their colour, take them out, and put in new ones. Repeat this till you are ſatisfied with your tincture. When you take the violets out, you muſt preſs them gently; then ſweeten that brandy according to diſcretion; and, if you chooſe, you may add again a little orange-flowers for the ſake of the odour.

LVII. *To make a clear and white* hypocras.

To every one pint of claret, add eight ounces of ſugar, and nine, if it be white wine; half a lemon, four cloves, a little cinnamon, which ſhould be double the quantity of cloves; three grains of pepper; four of coriander; a little bit of ginger, and eight almonds cut in bits.—Let the whole be bruiſed and put into a pan, with the wine poured

poured over it; ſtir, infuſe one hour, and ſtrain through the flannel bag.

LVIII. *For the white* hypocras.

To make the white *hypocras*, three pints of white wine; one pound and a half of ſugar; one ounce of cinnamon; twenty three leaves of mace; two grains of whole pepper; with two lemons cut in ſlices. Then, when you ſtrain the liquor through the flannel bag, fix a grain of muſk in the pucked end of it.

LIX. *To make the true* Eau-de-Noiau.

Pound one pound of apricot kernels, without reducing them into oil. Then bruiſe another pound of cherry-ſtones, wood and kernels all together. Put all in a pitcher of five or ſix gallons, in which put only three and a half, or four gallons of the beſt brandy, and two of water; fifteen pounds of ſugar; to every one quart of liquor add two grains of white pepper, and eight drachms of cinnamon, both bruiſed. Let all infuſe forty-eight hours, and then ſtrain the liquor through the flannel bag.

LX. *To make* Eau-de-Fenouillette, *ſuch as comes from the the Iſle of* Retz.

Take one pound of *Florence* fennel, the greeneſt and the neweſt you can find. Put it in an alembick, with one ounce of good liquorice root, three quarts of brandy, and two of white wine. Diſtil by the ſand bath, two quarts of good eſſence, which you muſt take away as ſoon as the white fumes begin to riſe, becauſe they would undoubtedly hurt the liquor by whitening it.

2. To every *one* quart of this eſſence, perfectly clear and tranſparent, add *ſix* of genuine brandy, and one of ſpirit of wine, with one of boiled water that has been cooled again, in which laſt, juſt before mixing it with the other liquors, you muſt introduce one quart alſo of clarified ſugar, or ſirup.

3. Make this mixture in a large and wide glazed pan; and,

and, when the doſes are thus introduced together, taſte the liquor, that you may judge whether or not all are right, and be in time to add either ſome more eſſence of fennel, or ſirup of ſugar, or brandy, &c.—If it taſte bitter or rather tart, you may correct that defect by the addition of a little more cold water which had boiled.

4. After this, bruiſe half a pound of ſweet almonds, which put in another pan, with five or ſix quarts of crude water, and boil well with it, then ſtrain through a flannel bag, in order to ſeaſon it as it were, by preparing and greaſing it. When, therefore, the bag begins to run clear, and all which was in it is almoſt gone, ſo that it only drops, change the pan under it, put another clean one, and pour your preparation, ſuch as mentioned in the above n. 3. in the bag, over the ground of almonds which was left in.—Should this proceſs ſeem too troubleſome to you, you may at once mix the half pound of bruiſed almonds in your liquor, and then throw it in the flannel bag, ſtraining, and re-ſtraining it over and over again in that ſame bag, till at laſt it runs clear; to aſſiſt it even in which, you may add half a pint of pure and genuine cow milk. But in obſerving the firſt preſcription, there reſult leſs lye at the bottom of the veſſel in which you keep it for uſe.

5. When you run it for the laſt time, which cannot be before it runs quite clear, obſerve to put a funnel on the mouth of the pitcher or bottle which receives it, and over it a crape, in order to retain the ſpirits which might evaporate.

6. You may amber afterwards the liquor, with a little powder of muſk and amber, prepared as mentioned in Art. xxxvi. of this chapter. This liquor is of a ſuperior delicacy.

LXI. *To make an hypocras with water.*

Take half a pint of white wine, and ſix times as much water which has boiled; add the juice of two lemons, and five or ſix quarters; the juice of a Seville orange, twenty-four grains of cinnamon; two or three cloves; one leaf of mace; one pugil or two of bruiſed coriander; four grains of whole pepper bruiſed; one quarter of a pound

of

of golden pippins cut in ſlices; half a pound of ſugar; half a Portugal orange, with a few zells, and a quarter of a pint of milk. Mix all well; and two hours after the infuſion, ſtrain it through a flannel bag, and perfume it with a little prepared powder of muſk and amber. Some, however, who do not like amber, content themſelves with increaſing only the doſe of cinnamon.

LXII. *Various liquors made with hypocras.*

You can make hypocras with either of the following liquors; *viz.* Spaniſh wine; Muſcat, Rhine-wine, Hermitage, Champaign, &c. adding to any of theſe wines the ſame proportion of ingredients as above deſcribed; and clarifying well afterwards by means of filtration.

LXIII. *A roſſolis, Turin faſhion.*

In three quarters of a pint of orange-flower water put to infuſe a little ſtorax, a little muſk, a little amber. Twenty-four hours after theſe ingredients have been put together, ſet them a boiling for half a quarter of an hour on the fire, then ſtrain it through a cloth. Add next a pint of genuine French brandy. Should any tartneſs be prevailing, add ſome honey or ſugar, according to diſcretion. But if you chooſe to have it ſtronger, then you may add ſpirit of wine, till the taſte is come to the degree of ſtrength you would have it.

LXIV. *An admirable oil of ſugar.*

Rinſe a matraſs with vinegar, then put in it ſome dry powder ſugar, or lump ſugar pulveriſed. Keep that matraſs on hot aſhes, turning and whirling it round and flat ways, by means of the neck of the matraſs which you hold in your hands with a cloth, and ſtop it not. The effect is ſuch, the heat occaſions the vapours to riſe about the matraſs, which by turning and whirling it as above-mentioned, makes the ſugar which is in it re-ſoak and imbibe them again. This operation diſſolves the ſugar, and reduces it into a ſort of oil.

LXV. *Another*

LXV. *Another oil of ſugar, without the aſſiſtance of fire.*

Take a lemon, which hollow and carve out inwardly, taking out all the pulp as ſkilfully as poſſible. Then fill it up with ſugar-candy in powder, and ſuſpend it in a very damp cellar, with a baſon under it. There will drop an exceeding good oil, which is endowed with the moſt admirable qualities for conſumptive people, or them who are affected with a difficulty of breathing.

Note. A little of that oil in liquors gives to any one of them, to which it is added, a very fine flavour.

LXVI. *An admirable eſſence of red ſugar.*

1. Pulveriſe five pounds of the beſt double refined, or royal ſugar; which when done, put along with eight ounces of brandy in a large matraſs, over a ſand bath. Diſtil ſome part of this firſt, on a ſlow fire, to avoid burning the ſugar. Re-put the diſtilled liquor over the ſugar again in the matraſs. Continue to diſtil and pour the liquor again in the matraſs over the ſugar, till the ſugar becomes red, which will happen at the ſeventh or eighth iteration of diſtillation.

2. Now diſtil out all the brandy, and on the remaining ſugar pour common water, which diſtil alſo, then add ſome more, continuing ſo to do, till you have drawn out all the tincture of the red ſugar.

3. Take next all theſe red waters, and run them through the filtering paper, then diſtil the phlegm on a gentle fire to ſiccity (or dryneſs). Put again this diſtilled phlegm on the reſidue. Which place all together in a cold cellar. You will find ſome red chryſtals, which pick up, and when dry, pulveriſe; then pour brandy over to diſſolve. This admirable quinteſſence of ſugar has the virtue of preſerving the radical moiſtneſs of the inſide, and our health.

LXVII. *Another oil of ſugar, exceſſively good.*

Cut off the end of a large lemon, of which ſqueeze out the juice; then fill it with fine ſugar, and apply to it again the cut-off piece. Put it in a clean glazed pipkin,

pipkin, which place to boil one quarter of an hour; put it in a bottle; it will never congeal, and that oil is good for the ſtomach, colds, catarrhs, &c. The odour and taſte are both exceſſively agreeable. The doſe is one table ſpoonful at a time.

LXVIII. *How to extract the eſſential oil from any flower.*

Take any flowers you like, which ſtratify with common ſea ſalt in a clean earthen glazed pot. When thus filled to the top, cover it well, and carry it to the cellar. Forty days afterwards put a crape over a pan, and empty all on it to ſtrain the eſſence from the flowers by preſſure. Bottle that eſſence, and expoſe it for four or five weeks in the ſun, and dew of the evening to purify. One ſingle drop of that eſſence is enough to ſcent a whole quart of liquor.

LXIX. *Eſſence of jeſſamine, roſes, and other flowers.*

1. Take roſes of a good colour, and freſh gathered. Pick all the leaves, which expand in the ſhade on paper. For two or three days, during which you are to leave them there, aſperſe them, morning and evening, with roſe water, ſtirring them each time.

2. When this has been performed, put them in a glaſs, or varniſhed veſſel, which ſtop as perfectly as you can, and place in the hotteſt horſe-dung, which renew every five days. A fortnight after this, place the veſſel in a *balneo mariæ*, adapting a bolt-head to it and a receiver, and lute all well. Diſtil the water, on which you obſerve the eſſence ſwimming. This you muſt divide by means of a wick, or filtering paper. Put the eſſence in a glaſs phial well ſtopped.

LXX. *To draw the eſſential oil of roſes.*

Pound in a mortar thirty pounds of leaves of roſes with three pounds of common decrepitated ſalt; then put all in a pot well luted, which ſet in a cool place. Fifteen or eighteen days after, moiſten well this matter with common water, ſtirring it till reduced into a pap.

Then

Then put it in an alembic with its refrigerator. Make a pretty ſmart fire, which will ſend firſt the water, next the oil, ſuſceptible of congealing by cold, and liquifying again by heat. One drop of that oil gives more ſmell a hundred times than the diſtilled water from the ſame roſes.

LXXI. *The oil of cinnamon.*

Bruiſe firſt the cinnamon coarſely in a mortar, and put it a-ſoaking in water, in which add a little pounded tartar, with a table ſpoonful or two of honey. Eight or ten days after, place the veſſel on a ſand bath, and you will obtain by diſtillation, an excellent oil of cinnamon.

LXXII. *An eſſence of jeſſamine.*

Diſſolve over the fire, one quarter of a pound of ſugar in a quarter of a pint of common water. After having ſkimmed it, boil it to perfect evaporation; then take it off the fire, and fling two handfuls of jeſſamine flowers in it. Cover the veſſel, and two hours after, ſtrain the eſſence, and bottle it. It is an agreeable odour. The doſe is one drop only, or two *per* pint of liquors.

LXXIII. *Eſſence of ambergris.*

Set to infuſe, half a dozen of lemon peels in three half pints of ſpirit of wine, ſet them thus in a cold place for two days, in a veſſel well ſtopped. After that time take off the peels, which ſqueeze through a linen, and put as many freſh ones in the ſtead, which reiterate three different times. When you take off the laſt peels, grind three grains of ambergris and one of muſk, which put with the ſpirit of wine in a matraſs over a gentle fire. till the amber is perfectly diſſolved. There will fall ſome ground at the bottom of the matraſs, decant the clear part from it in a bottle, and keep it for uſe.

Note. This eſſence might be made with the burning ſpirit of roſes.

LXXIV. *Eſſence*

LXXIV. *Eſſence of* capon *and other* fowls.

Cure the inſide of any fowl, by taking away all the entrails. Fill it with lump ſugar, pulveriſed and mixed with four ounces of damaſk raiſins, perfectly ſtoned. Sew the fowl up again, and put it in a pipkin, which cover carefully with its lid, and lute all round with paſte. Place this pot in an oven, when the bread goes in, and take it out along with it. Then uncover it, and ſtrain the liquor through a cloth, with expreſſion of the animal. This eſſence is the greateſt reſtorative for old or enervated people; likewiſe to haſten the recovery of health after long illneſs. Take two large table ſpoonfuls early in the morning faſting, and as much at night after ſupper.

LXXV. *Virginal milk.*

1. Take one ounce and a half of benjamin; ſtorax as much, and one of eaſtern white balm. Put all in a thick glaſs phial, with three half pints of ſpirit of wine, which pour over. Put this in digeſtion over hot aſhes, till the ſpirit of wine appears of a fine red colour.

2. To uſe it, put four drops in half a pint of water, and it inſtantly turns as white as milk.

3. Exteriorly uſed, it whitens the ſkin, if you waſh with it; it has likewiſe the ſame effect upon teeth, by rinſing the mouth, and rubbing them with it. Interiorly taken, it cures the heats and burning of the extinction of voice.

LXXVI. *How to make the* hipotique.

To every quart of water, put one quarter of a pound of ſugar, which boil and ſkim carefully. Then add a few cloves, a little cinnamon, and ſome lemon zeſts, which boil altogether four or five minutes longer, and ſtrain it through a cloth. To colour it, you may put half a pint of good red wine to each quart of water, and to give it a certain *piquant*, you may add a little brandy if you like.

LXXVII. *An*

LXXVII. *An exceeding good ptisan.*

Boil well in six quarts of water, one pound of liquorice root: to which you may add one handful or two of coriander seed, and a few cloves. Two or three hours after this infusion, strain the liquor through a cloth, and keep it to make ptisan, when you want it, by putting a discretionable quantity of it into some common water with a few lemon peels to give a *pointe*. The liquorice may serve twice.

LXXVIII. *How to colour any sort of liquor.*

Bruise into a coarse powder some *santalum rubrum*, which put into a bottle with a discretionable quantity of spirit of wine poured over it. In five or six hours time the tincture will be very high; therefore it will be fit to give a colour to any liquor you chuse, by pouring some of it into the liquor, and shaking it till you find it is coloured to your liking.

LXXIX. *A ladies fine* rouge, *not hurtful to their skin like other* rouges, *wherein there always enters a mixture of lead or quicksilver.*

The above preparation of *santalum rubrum*, modified with common water to take off the strength of the spirit of wine, and an addition of one clove, a little civet, a little cinnamon, and the bulk of a filbert of alum, *per* quarter of a pint of liquor, with safety.

LXXX. *A fine smelling water, at a small expence.*

Take two quarts of rose water drawn by distillation in *balneo mariæ*, which put in a large bottle filled with fresh rose leaves. Stop this bottle well with a cork and wax, then expose it to the sun, for a month, or six weeks; afterwards decant the liquor into another bottle, in which, for every one quart of liquor, add two grains weight of oriental musk, and cork it well. This water is of a charming fragrancy, and lasts a great while. It communicates the odour to them you touch after having rubbed your hands with it.

LXXXI. Eau-imperial, *or imperial water.*

1. Dry in the ſun for a fortnight, the rinds of twenty-four oranges. Then pound a quarter of a pound of nutmegs, the ſame quantity of cinnamon and as much cloves. Soak all together in a large bottle with roſe water, and expoſe it for ſeventeen days in the ſun.

2. Then pound one pound of roſe leaves which have been gathered two days before, with two handfuls of ſweet marjoram, two pounds of lavender, two handfuls of roſemary, two pounds of cyprus, two handfuls of hyſop, as much wild roſes and as much betony. Put all theſe together in a bottle well ſtopped, and place it in the ſun for two days; then having poured ſome roſe water over them, ſet them again three days longer in the ſun.

3. When this is done, have an alembic ready, in which make a bed of one pound of roſes, and over it another bed of one half of your *aromates*; next, another bed of one pound of violets of March, and over it a bed of the other half part of your *aromates*, with a ſcruple of muſk, and as much of ambergris. Adapt the receiver to the bolt head, and diſtil the liquor by gentle heat.

4. When the water is entirely diſtilled, let the veſſels cool, then unlute them, put on the *fæces* a pint of roſe water. Lute the veſſels again, and diſtil this water as you did the firſt. Unlute again and put vinegar in the alembic over the ſame *fæces*, and diſtil it like wiſe as you did the preceding waters. That vinegar will have great virtues, and eſpecially that of preſerving you againſt an air infected by contagious and peſtilential diſorders.

LXXXII. *The ſyrup of* orgeat *of Montpellier.*

1. Take a pound of barley ſoaked in water; peel it grain by grain, make a knot of it in a bit of linen. Put this in a pot over the fire with about a quart of water. Boil it gently three or four hours, put into the water one pound of ſweet almonds, which mix and dilute well. Then take off the knot of barley, which pound like the almonds and mix like them in the water. Strain all together through a piece of linen; then pound the grounds well,

well, and pour all the water over it again, which ſtir and ſtrain again. This water will look very thick. Put one pound of lump ſugar in powder to that liquor, and boil into a ſyrup. You will know that the ſyrup is done to its right degree if, letting one drop fall on the back of your hand, it remain in the form of a pearl. Then take it off from the fire, and when cold, give it what flavour you chuſe, whether amber, muſk or other odour. Such is the ſyrup of orgeat, which bottle and keep for uſe.

2. To make the draught which, in coffee houſes or other places of refreſhment, is called *orgeat*, put at the bottom of a decanter, one ounce of that ſyrup, and pour common water over it, then ſhake the decanter well to mix the water and ſyrup together. It is fit for drinking directly.

LXXXIII. *To make an imitation of coffee.*

1. Take any quantity of horſe beans, which put into a pan to roaſt over the fire till they begin to blacken. Then take a little honey with the point of a knife and put it among the beans, turning them well with it, till ſoaked in the beans, repeating the ſame proceſs till they are of a deep brown cheſnut colour. Now take them from the fire, and while they are quite burning hot, put for every large handful of beans, half an ounce of *caſſia mundata*, with which imbibe them well by ſtirring and ſhaking in the pan as much as you can, and they are done.

2. Theſe grind in the mill and make coffee of, it will have the ſame taſte and flavour as the true Moca-coffee, ſo as not to be diſtinguiſhed from it by the greateſt connoiſſeurs.

Note. This coffee may be drank either thick or clear, with ſugar as uſual.

LXXXIV. *Another way.*

Take a quart of rye, which clean and roaſt as the beans in a pan till of a fine brown, then grind it. To uſe it, mix it half and half with the true coffee, and make it as uſual, by putting it in boiling water and letting it boil five minutes.

Note. This coffee is much uſed among the people of quality, who prefer it to ſtrengthen the ſtomach, eſpecially when taken before going to bed.

LXXXV. *Directions for preparing the true coffee.*

1. True coffee muſt be roaſted in an iron pan, or in a glazed earthen pan, over a clear charcoal fire without flames. Turn it with a ſtick while it is on the fire, to make each grain roaſt more regularly and equally. It is well roaſted when it is all of a dark brown.

2. There is a much better method of roaſting it, by means of a certain iron drum made in the form of a ladies muff-box, with a handle at one end, an iron peg at the other, and a latch-door in the middle. By this door you introduce the coffee, which you faſten in by means of the latch. Then propping it on the top of a chafingdiſh made on purpoſe, in which there is a charcoal fire, you roaſt the coffee by turning the drum over it with the above-mentioned handle; and thus the coffee roaſts in the moſt regular manner.

3. When the coffee is roaſted, grind it, keep it cloſely confined in leaden boxes, with a ſcrewing lid. However, it is ſtill much preferable to grind no more at a time than what one wants to uſe at once.

4. The liquor is made by putting one ounce of that powder to three quarters of a pint of boiling water to make three full diſhes. And, after an infuſion of ten minutes, during which it is kept boiling, the coffee is fit for drinking.

LXXXVI. *A receipt for making chocolate.*

1. Diſſolve in a copper pan ſome pulveriſed royal lump ſugar, with a little orange water. When the ſugar is turned into a ſyrup throw in the cocoa, the vanilloe, the cinnamon, Mexican-pepper, and cloves, all, and every one of which, ought to have been firſt reduced into an impalpable powder. Stir all well while it boils; and when you judge it to be ſufficiently done, pour the paſte on a very ſmooth and poliſhed table, that you may roll it, and give it whatever form and ſhape you like.

2. To

2. To prepare it with either milk or water, in which, when boiling hot, you firſt diſſolve it, then, with a box-mill, with a long handle, you mill it to froth in the pot in which it is a making, and pour it afterwards in cups to drink.

CHAP. XIV.

SECRETS relative to the CONFECTIONARY BUSINESS.

I. *Preſerved nuts.*

1. GATHER the nuts, before the woody ſhell begins to harden under the green rind. Cut open and throw off that green rind; and throw immediately the nut into a pail of cold water, to prevent its blackening. Boil them four or five minutes, and throw the firſt water away becauſe it is bitter. Put freſh water, which boil again, and throw away as the firſt, and repeat this operation a third and fourth time, if required, to take off all the bitterneſs of the nuts.

2. After they have boiled in their laſt water, take them out, and throw them into cold water, for fear they ſhould turn black ſtill. From this water change them again into another, in which put them one by one, as you take them from the firſt, and preſſing them between your fingers to purge them from all the bitter water they might ſtill contain.

3. Now make a ſyrup as uſual, in which boil ſome lemon peels for the ſake of fragrancy only, taking them

all out after a few minutes of their being in, then put the nuts in their ſtead, which leave to boil in the ſyrup as long as you think proper.

II. *Orange flower-paſte.*

1. Boil in four quarts of water one pound of the bare leaves of orange flowers well picked. When theſe are deadened and ſoftened by this boiling, take them out with a ſkimmer, and ſet them to drain. Then pound them in a mortar with the juice ſqueezed out of two lemons, more or leſs, according to your taſte.

2. In the juice, which comes from theſe flowers by pounding, diſſolve one pound of ſugar, and put the paſte in. Stir it a little, then let it cool, and ſhape it afterwards to your liking.

III. *Paſte of jeſſamine.*

Have one quarter of a pound of jeſſamine flowers, pick them. Boil them in water till ſoftened, and they have given their odour to it. Then take the flowers out, which drain, and pound in a marble mortar. Put ſugar in the water, and boil it to a ſyrup; put the paſte and ſpirit in while it boils, for two or three minutes. Now take it out, and ſhape it as you would like to have it.

IV. *Apricot paſte.*

Boil one pound and a half of ſugar into a ſyrup. Put in three pounds of apricots, deterged of their ſkin, and pounded in a marble mortar, &c. Then proceed as above for the reſt, obſerving only to chuſe the ripeſt apricots you can find.

V. *Currant paſte.*

1. Weigh ten pounds of currants, which put into a pan with one of clarified ſugar. Skim them while on the fire, and after they ſhall have boiled a while, drain them on a ſieve, then ſtrain them.

2. Now

2. Now put this liquor again in the pan and boil it, adding more ſugar in powder, till conſumed and waſted to the conſiſtence of a paſte. Then form the paſte in the ſhape you like.

VI. *A* verjus-*paſte.*

Chuſe *verjus* half ripe: cure it from all ſtones, and put it in a pan on the fire with a pint of water to every three pounds of fruit. After five minutes boiling take it out and drain in. Squeeze it through a ſieve, then waſte it to thickneſs for a paſte. Now boil as many pounds of pulveriſed lump ſugar to a ſyrup, as there are of fruit. When done, abate the fire, and add the fruit paſte to the ſyrup, continuing to concoct all together on a mild fire. Then give the paſte, as ſoon as it is come to a proper conſiſtence, what ſhape you like.

VII. *How to make ſyrups with all ſorts of flowers, which ſhall be poſſeſſed of all their taſte, flavour and fragrancy.*

Heat in a pan about half a pint of water, then put in it ſugar in the proportion to the quantity of flowers you may have; boil, ſkim and thicken it to a proper conſiſtence. When done put your flowers in a glazed veſſel, and cover it over with a linen, thro' which pouring the ſyrup, you ſtrain this upon the flowers. Theſe being thereby quite deadened, put all together again in the ſame piece of linen, and ſtrain it again in another veſſel, ſqueezing well the flowers. Then bottle this ſyrup, and keep it for uſe well ſtopped.—Whenever you want to give the flavour of thoſe flowers to any liquor, ſweeten it with this ſyrup.—To every four ounces of flowers, the quantity of ſugar requiſite to make that ſyrup is generally one pound and a half.—Obſerve that all flowers muſt be well picked of all their cups, ſtaminas, *&c.* and nothing but their leaves made uſe of.

VIII. *Raſpberry ſyrup.*

Maſh the raſpberries, and dilute them with a moderate

addition of water, then ſtrain them to divide the thick from the clear part. To every quart of this clear liquor put one pound of lump ſugar pulveriſed, boil all together on the fire in the preſerving pan. Skim and clarify carefully the ſugar, with the white of an egg beaten in water. When the ſyrup is come to its right degree (which you may know by throwing a drop of it in a glaſs of water, if the drop ſinks whole to the bottom, and fixes itſelf there, without running out along with the water, when you throw this away), take it off the fire, and let it cool for bottling.

IX. *Apricot ſyrup.*

Cut in ſmall bits ſix pounds of very ripe apricots, which boil in a gallon of water till they are reduced to a pulp. Let them cool, then ſqueeze them through a ſieve. Now ſtrain again this liquor through the jelly-bag, and put it in the preſerving pan on the fire, with four pounds of ſugar. Skim, clarify, and boil the whole to a ſyrup, which try as above directed in a glaſs of water; and, when done, let it cool, and bottle it to keep for uſe.

X. *The* verjus *ſyrup.*

Have *verjus* in grapes, which pick out of its ſtalks, and pound in a marble mortar. Strain it through a ſieve firſt, then through a jelly-bag to get it finer. To two quarts of this juice, put into a preſerving pan, add four pounds of ſugar, and boil it according to art to a ſyrup.

XI. *A general manner of making ſyrups, applicable to almoſt all ſorts of fruits, eſpecially currants.*

1. Pick a quantity of red currants of all their ſtalks, and ſqueeze them through a ſieve in a commodious veſſel. Carry this veſſel to the cellar, placing it on a ſtool, or any ſuſpending ſhelf from the ground: and, after that juice ſhall have worked three or four days, ſtrain it through a ſieve in another veſſel, then through the flannel bag to get it as clear as poſſible.

2. Now for every two quarts of ſuch liquor, have four pounds

pounds of ſugar, which put in a preſerving pan, and melt over the fire, with a little common water to help the diſſolution of it. Boil it thus to the conſiſtence of caramel, without burning it; and, when at that degree, pour through the holes of the ſkimmer the meaſured liquor, which muſt boil alſo to a perfect ſyrup according to the afore-preſcribed trials.—All this being well executed, take it off, let it cool, and bottle it for uſe.

Note. All ſorts of ſyrups, ſuch as cherries, raſpberries, and others, may be made in the ſame manner, with this difference only, that they are not to be put to work in the cellar, but employed directly as ſoon as the juice is ſqueezed out of the fruits.

XII. *To make liquid currant jam.*

Pick four pounds of currants, and clear them of their ſtalks. Put aſide two pounds and a half of them in a diſh, and ſqueeze the other one pound and a half remaining. Now, in a preſerving pan, diſſolve four pounds of ſugar; and, when come to a ſyrup, put in the two pounds and a half of whole currants along with one pound and a half of juice of the ſame, which boil all together to perfection.

XIII. *To make the ſame with cherries.*

Have two pounds of the fineſt cherries, take off both tail and ſtones. Preſs out the juice of them, and put it in a preſerving pan with a pint of water, and four pounds of ſugar. Boil all together, then add ſix other pounds of the fineſt cherries, from which the tails only, and not the ſtones, have been picked. Boil all to a ſyrup, and when this ſtands the trial of the glaſs of water, as mentioned above, all is done, and fit for potting.

XIV. *Another way to preſerve cherries.*

Put eight pounds of cherries, *either with or without their ſtones*, in an earthen pan over a moderate charcoal fire, to evaporate their ſuperfluous moiſtneſs; keep inceſſantly ſtirring, taking care to avoid maſhing them. Then

add four pounds of lump ſugar pulveriſed, continue to ſtir the cherries, and boil all, ſo that the bubbles ſhould cover the fruit, and that the ſyrup might hereby be ſkimmed till done to perfection, when a drop of it runs with difficulty, being cold; then the cherries are fit to pot.

XV. *To make the liquid raſpberry-jam.*

Boil, to a ſtrong ſyrup, four pounds of ſugar. When done, take the pan off the fire, and put in four pounds of raſpberries well picked, and not maſhed in the leaſt. Put them in gently at firſt, and with a very particular care, for fear of ſqueezing them; for, when the heat of the ſyrup has once ſeized them, they are not ſo apt afterwards to break. Stir them therefore a little in the ſugar, and when they have thrown in their juice, put them again on the fire, to complete the making of the ſyrup.

XVI. *The* verjus-*jam.*

1. Open four pounds of *verjus* in grapes, with a penknife: and, with the ſame, pick out all the ſtones. Throw theſe grains, as you do them, into a bowl of clean freſh water. When done, take them out again with a ſkimmer, and put them a-draining in a ſieve, throw them next into a pan of boiling water.

2. While this is in the water, let it ſimmer; and, when the *verjus* begins to ſwim on the top of the water, take it directly from the fire, and cover it with a cloth to cool gently, while you diſſolve, boil, and clarify four pounds of ſugar to a ſyrup.

3. A little while before the ſyrup is ready, ſet your *verjus* a-draining in a ſieve, then throw it in the ſugar, when this is done to the proper degree. Continue to keep up a gentle, regular fire, till you ſee the *verjus* taking a good green: and, when that is the caſe, give it a briſk fire, and finiſh it quickly, elſe it would firſt turn black, and then yellow.—Take care not to do the ſyrup too much, for it would be apt to candy.

XVII. *The*

XVII. *The same with powder sugar.*

1. After the *verjus* is picked, and the stones taken out as before, it must not be thrown in the cold water, but in a dry preserving pan only, not to lose the juice which comes out of it when cut.

2. Then to every pound of *verjus*, add another of sugar, such as was mentioned, powder this over the *verjus* which is in the pan, and set all on a gentle fire, to simmer and not boil. This will make it come very fine and green, when you must, as in the preceding receipt, be very expeditious in finishing it, for the same reasons therein mentioned already.

XVIII. *Peeled* verjus.

Chuse some fine ripe *verjus*, which peel carefully with the point of a penknife and stone, then throw into a dry bowl, to preserve the juice.—Then dissolve, boil and clarify as many pounds of sugar as you have of fruit, in which, when done to the consistence of a syrup, throw in the *verjus* from the bowl. Stir and boil it gently, till it turns green, and finish it with speed. Let it cool, and put it in very dry pots.

XIX. *To preserve* March, *double or single violets.*

March violets, you must as soon as they are come to the degree to make them liquid, take them out immediately from the fire, and while the sugar is still boiling, take the violets out of it with a skimmer, and put them a draining in a sieve, or table cloth, till they are cold. Then put them incessantly with your hand, for the space of two hours, and powdering over them, at distances of times, some of the finest royal loaf sugar, in small quantities at a time, in order to dry and candy them.

XX. *Another way to make them liquid.*

If you want to make the best use of the same clarified sugar, which served to make dry preserved violets, you

may do it by putting half a pound or thereabouts, of theſe flowers in the ſame ſyrup then boiling on the fire, and there let them ſoak and lie for five minutes, they will then be liquid.

XXI. *To preſerve apricots.*

Chuſe a quantity of apricots, juſt turned, but not ripe, and the fruit of which has ſtill all its hardneſs and greenneſs. Take out the ſtones, by means of a ſmall-bladed knife, which introduce at the point of the apricot, till you feel the ſtone, and then puſh to make it come out at the tail. When you have thus prepared four pounds of them, (weighed after ſtoning) have a large wide pan of boiling water on the fire, in which throw them in order to blanch them, taking great care that they ſhould not ſpot in the water. When blanched, take them out with a ſkimmer, and ſet them a draining on a ſieve. Then boil and clarify four pounds of ſugar into a ſyrup. When done, take it out, and put in your apricots ſoftly, ſet them again on the fire, and give them two or three bubbles; take the pan from the fire and let them cool. By this means they throw off their ſuperfluous moiſtneſs and take the ſugar. When cold, take them from the ſugar with a ſkimmer, and ſet them a draining, while you put the ſyrup on the fire to boil. When drained, put them again into the boiling ſyrup, and give them five or ſix bubbles more, after which let them reſt till the next day, put them again on the fire, and finiſh them. They will be what is called Liquid, and you may pot them in that ſtate.

XXII. *How to make a dry preſerve of them.*

Proceed as above-directed, till the time they are fit for being potted in liquid, inſtead of which take them again out of the ſyrup, and ſet them a draining, then range them on ſlates at regular diſtances, ſo that they may not touch one another. When thus prepared, powder on them, through a ſilk ſieve, ſome of the fineſt loaf ſugar pulveriſed, and put them in the ſtove to dry. When dry

on

on that ſide, take them out from the ſlates, and turning them the other ſide upwards on a ſieve, or ſome ſorts of ſmall light willow grates made on purpoſe; powder them again with ſugar as before, and when equally dried and cooled, you may put them in boxes with white brown paper.

Note. All ſorts of plums admit of the ſame mode of operation, to make them into dry or liquid preſerves.

XXIII. *To preſerve green apricots.*

1. Gather apricots when green and very freſh. Then pound ſome ſalt in a mortar, and make it as fine as poſſible, and putting a handful of this ſalt in a napkin, with as many apricots as you think you can well manage, fold the napkin lengthways, bringing the long ſides of it over the apricots, and taking the ends of it gathered one in each hand, ſhake and roll them backwards and forwards with the ſalt in the napkin, adding one ſpoonful or two of vinegar, which pour over them, when thus agitated. This proceſs is with intention of curing them of their down, and when that is obtained, throw them in cold water to waſh them well, and continue ſo to do with the reſt.

2. After having thus well waſhed them in that firſt water, put them into new cold water, to waſh them again, after which, put them a draining on a ſieve. Then boil ſome water, and throw them in, wherein they are to be kept boiling till they become ſoft, and which take care to try now and then, by taking one or two with the ſkimmer, and thruſting in a fine ſkewer; if this get an eaſy admittance in the apricots, they are ſufficiently done. Now take the pan from the fire without delay, and with the ſkimmer take the apricots from that boiling water into ſome cold.

3. When your apricots are in this ſituation, make a ſirup with as many pounds of ſugar as you have got fruit, and having put in your apricots, let them boil very gently. They will immediately turn of a very fine green. You muſt not preſs on the finiſhing of them; on the contrary, take them off the fire, and give them a couple

of

of hours reſt, during which they throw off their moiſtneſs, and take the ſugar. After they have thus reſted a while, ſet them again on the fire, and finiſh them as faſt as you can, that they may preſerve their greenneſs.

XXIV. *To make the* Cotignac *liquid.*

Pare the quinces, and cut them ſmall, after having taken away the cores and kernels. Put a gallon of water a boiling, then put them in, and let them boil there, till reduced almoſt to a pulp. Strain all through a cloth, and ſqueeze it well into a bowl. When done, ſet it on the fire in the preſerving pan, with four pounds of ſugar, and boil it gently, till taking ſome with the ſkimmer, and letting it fall on a plate, it ſhall riſe up like a jelly. Then puſh on the fire, and in five minutes afterwards the *Cotignac* is done.

Note. If you put the peel and kernels into a knot, and boil them in that manner in the water, the jam will ſooner be red.

XXV. *Another way.*

Pare four pounds of quinces, which cut into bits, and put in the preſerving pan, with a ſufficient quantity of water to ſoften them by boiling gently. Then add four pounds of lump ſugar, and continue boiling the whole till it is half done. When this is the caſe, ſtrain all through a cullendar, and put it again in the ſame pan over the fire to boil it to perfection, which you know, when by ſtirring the jam hard, you may ſee the bottom of the pan quite plain, and entirely uncovered. Then it is time to take the pan from the fire, to let it cool and pot the *marmalade.*

XXVI. *How to make the caramel.*

Boil ſome ſugar till it be almoſt in powder; then for every half pound of ſugar, throw in one ounce of ſyrup of capillaire, and immediately throw the whole into cold water.

XXVII. *To*

XXVII. *To make* Raiſinet.

Take black grapes, the beſt and the ripeſt. Pick the grains from the ſtalks, throw away theſe and ſqueeze the others between your hands, and put both the huds and the juice in the preſerving pan, to boil on a clear ſmart fire. Neglect not to ſtir well this liquor, all the while it is a-boiling, with a wooden ſpatula, for fear it ſhould burn at bottom. When you perceive it may have waſted a third, ſtrain it through a ſhear-cloth, to expreſs the juice out of the huds. Put your juice again into the pan to boil, and ſkim it, ſtirring as before with the ſpatula, eſpecially towards the end when it begins to thicken. To know when it is done, put ſome on a plate, and if, by cooling, it becomes ſolid, it is ſufficiently done. Then is the time to take it off from the fire, and let it cool, after which you put it into ſtone jars.

XXVIII. *To preſerve quinces in red.*

1. Chuſe the moſt even quinces not ſtony. Cut them into four or eight quarters as you like beſt, then pear and core them. If you meet with any ſtones in the quarters, cut them off too. As you prepare them thus, throw them into cold water. Save the peels and cores; and mixing among them, when all your fruits are prepared, ſuch of them as are ſmall, crooked, and otherwiſe ill formed, and unfit to go along with the others, boil all in a ſufficient quantity of water to make a ſtrong decoction, which paſs when done, and ſtrain through a ſtrong cloth into a pan.

2. In this decoction, put other quarters, and boil them in the preſerving pan. When ſufficiently done, put as many pounds of ſugar as you had fruit. Boil this gently, and in a ſhort time the quinces will become moſt beautifully red. When you ſee they are come to perfection, take them off the fire, and pot them; but do not cover them for a day or two after.

XXIX. *To*

XXIX. *To do the same in white.*

1. You must not make the decoction of the parings. When the fruit is pared as beforementioned, you must throw it into boiling water, and there let it continue to boil on the fire, till sufficiently done; then take it out with the skimmer, and put it a draining on the sieve.

2. While they are thus a-draining, make a syrup; and when this is skimmed and clarified properly, put your fruit in it boiling. Ten minutes after, or thereabouts, take the pan from the fire, and let all rest a while, then squeeze on it the juice of a lemon to whiten the quinces: and setting them again on the fire, finish them quickly.

XXX. *To preserve* rousselet, muscadine, *and other pears.*

1. Chuse *rousselet* pears, which should be neither too ripe nor too green; which pare very nearly, and boil in water till properly done. Before boiling them, observe to strike them to the heart from the head, with the point of a knife. When properly done in the boiling water, take them out with a skimmer, and throw them into fresh water.

2. Make next a syrup, with as many pounds of sugar as you have pears, in which put these, and boil them five or six minutes at first, then take them from the fire, and let them rest a while to throw out their superfluous moistness, and take the sugar. When that is done, set them again on the fire, to complete them quickly.

Note. By doing as above, you will have a liquid preserve of pears; if you want to have them dry, follow the directions given in Art. xxii. with respect to apricots.

XXXI. *A preserve of green almonds.*

1. Prepare a lye of pearl ashes, in which wash your almonds to rub their down off. Wash them next in another water, then into boiling water, in which they are to boil till softened, but not to open, which try now and then, by thrusting a fine skewer in some of them. When done enough, skim them out from this water, and throw them into cold, then set them a-draining in a sieve.

2. Now

2. Now make a ſyrup, and throw your almonds in while boiling. They will immediately recover their green; then finiſh them as expeditiouſly as you can for fear they ſhould turn black.—If you want to keep them, you muſt put pound for pound of fruit and ſugar.

XXXII. *To make the ſame into a* compote.

After having ſoftened them by boiling in water, put no more than five or ſix ounces of ſugar to every pound of fruit. Then boil the ſyrup into a pretty ſtrong conſiſtence, becauſe it liquifies ſufficiently afterwards by the moiſtneſs which the fruit retains.

XXXIII. *To make dry portable cherries.*

Prepare four pounds of fine *Kentiſh* cherries, by depriving them both of their ſtones and tails. Then have one pound of ſugar, which put a-diſſolving on the fire in a pint of water. When this begins to boil, throw your cherries quickly in, and make them boil thus in the ſugar till the ſyrup begins to thicken. When they are ſufficiently done, take them from the fire, and let it cool, after which put them a draining in a ſieve; then range them on ſlates, and powder through a ſieve ſome ſugar all over them, and place them in the ſtove, or for want of this conveniency, in a baker's oven, after the bread has been taken out. When dry on one ſide turn them on the other, and powder them over with ſugar as you did before; dry them in the ſame manner, and box them when cold, to keep for uſe.

Note. Plums may be done in the ſame manner. This ſort of preſerve is very agreeable, and may be carried any where.

XXXIV. *The preſerve of orange flowers, whether in looſe leaves, buds, or bunches.*

Have four or five pounds of orange-flowers; and that you may loſe nothing, but make the beſt you can of them, put them in alembic with two gallons of water. Lute well the veſſels, and diſtil about two quarts of good water.

water. Stop then the diſtillation, let the veſſel cool; and unluting them, put the orange-flowers a-draining on a ſieve. When done, throw them afterwards in cold water, ſqueezing over them the juice of a ſmall lemon to whiten them. Now take them out again from this water, and put them in a very light and thin ſyrup, lukewarm, for them to take the ſugar. When quite cold ſkim the flowers out of this ſyrup, and ſet them a-draining in a ſieve placed over it. After they are well drained, boil that ſyrup for five or ſix minutes, then let it cool again, till only lukewarm, and then put your flowers a ſoaking again for twenty-four hours in it. On the next day ſkim them off again, and repeat the ſame operation over again exactly as you did the day before. At laſt ſkim them out once more from the ſugar, and put them a-draining for the laſt time, after which ſcatter them on tin ſheets, ſlates, or ſmall boards, and having powdered them over with ſugar, put them a drying in an oven; when dry on this ſide, turn them on the other, and repeat the ſame again, till all is done, and fit to put in boxes.

XXXV. *A marmalade of orange flowers.*

1. Take one pound of them, which waſh and dry in a cloth, and having put them in a mortar, give them a few ſtrokes of the peſtle only to bruiſe them a little, not to maſh them quite, and to whiten them, ſqueeze the juice of a lemon over them.

2. Now clarify three pounds of royal ſugar; and when come to a proper ſyrup, throw in the orange flowers, which boil five or ſix minutes, and let cool. When cold, ſtir all well with a ſpatula, in order to mix equally the flowers along with the ſyrup, then put the jam into pots; and having left them twenty-four hours uncovered, paper them over as uſual.

XXXVI. *To make an apricot, or peach jam.*

1. Chuſe the ripeſt apricots, which clean of all hard knobs, ſpots and rotted parts. Cut them in ſmall bits in a preſerving pan, which have previouſly weighed. If you

you have put four pounds of apricots in it, reduce them by boiling over a gentle fire to two pounds only, which you muſt find out by weighing pan and fruit together, now and then till you find your right weight. When this is the caſe, put among your apricots thus reduced to one half, two pounds of lump ſugar pulveriſed, and mix all well for the ſpace of five minutes over the fire, then take all off, let it cool, and pot.

2. This compoſition you may, if you will, put into paſte on ſlates, or in tin moulds. There is not more exquiſite eating. You may alſo, with two or three roaſted, or baked apples, mix a couple of ſpoonfuls of this marmalade, and make exceſſive nice tarts with it, or again, with pears baked under aſhes.

XXXVII. *An apricot jam, after the* French *way.*

1. Chuſe ſuch ripe apricots as are fit to eat. Peel their ſkin off very neatly, and give them a bubble or two in boiling water, ſo as not to have them diſſolve in the water, and put them a-draining. When done, maſh them through a ſieve, and let them reſt a time to evaporate their ſuperfluous moiſtneſs.

2. While this is doing, make a ſyrup with as many pounds of ſugar as you have fruit, and take it off the fire; when the ſyrup is cooled, put your fruit in, which ſtir well with the ſpatula, then put all again on the fire for ten minutes, in order to make the fruit take well the ſugar. When the jam is well done, fine and tranſparent, pot it.

XXXVIII. *To make raſpberry, currant, and cherry jam.*

All theſe fruits muſt be ſqueezed through a ſieve, then clarify the ſugar, and throw in the juice, bring to perfection afterwards as directed in the laſt receipt.

XXXIX. *To make a good currant jelly.*

Have four pounds of currants after picking. Then diſſolve in water four pounds of loaf ſugar, which make into a pretty ſtrong ſyrup. Now put the currants in, and boil

boil so as to have them covered with the bubbles. Six minutes after such boiling, take the pan off from the fire, and pour the contents in a sieve to strain off all the liquid. Put this liquor again in the pan and boil it, till taking a drop with the skimmer, and pouring it on a plate, it congeals as it cools. Then it is fit to pot.

They who want to spare the sugar, and have a great deal of jelly at a smaller expence, may employ four pounds only of sugar to six of currants, after picking, and proceed as above. They must however observe to do the jelly rather more than in the preceding case, when the fruit and the sugar are pound for pound.

XL. *To make a* verjus *jelly.*

Take ripe *verjus*, which pick from its stalk. Put it in a pan with a couple of glasses of water. Let it boil for two or three minutes, and when deadened, throw it in the sieve to drain. Then put the juice on the fire with the sugar, and boil it into a jelly, to pot it afterwards.

XLI. *To make an apple jelly.*

1. Cut in small bits a dozen of gold rennets, and put them in the preserving pan, with three quarts of water, which boil to the reduction of one half. Throw all in a cloth to strain it through, and draw all the juice from the apples. Then, to this, put four pounds of sugar, which boil to a jelly.

2. To give a *pointe* to that jelly, you may add the juice of one lemon, and even the rasping of one half of its rind.

XLII. *To make the conserve of orange flowers.*

Take one quarter of a pound of orange flower-leaves well picked, which chop as small as you can, and wet over by squeezing the juice of a lemon. In the mean while clarify, and make into a strong syrup, two pounds of sugar, then take it off the fire, and let it rest a while. Some time after, stir it all round, and in the middle, with

with a ſpoon; and having thrown in your orange flower, prepared as before directed, mix all well with the ſame ſpoon, and put part of this compoſition into paper moulds, or caſes, and form the reſt into drops, or lozenges, on ſheets of paper.

XLIII. *A conſerve of violets.*

Pound in a mortar one quarter of a pound of violets well cleanſed and picked, which while you are a-pounding, you muſt wet with a quarter of a pint of boiling water. When it is thus wetted and pounded, ſtrain it through a flannel cloth; then having melted and clarified two pounds of ſugar into a ſtrong ſyrup, take it off the fire, let it reſt, and pour in afterwards what you have expreſſed from the pounded violets, ſtirring all well together with the ſpoon, and proceeding in every other reſpect for the reſt as directed in the preceding article.

XLIV. *A conſerve with raſpings of Portugal oranges and lemons, conjointly or ſeparately.*

Put your raſpings to dry in a plate. Prepare ſome ſugar into a ſyrup not quite ſo ſtrong as recommended in the laſt receipt. Take this from the fire, and ſtir it with a ſpoon, both round the pan and in the middle; then throw in your raſpings of lemon or orange, or even both together; and having ſtirred all well, put it in the moulds and make your drops.

XLV. *To make almonds* a-la-praline.

Make a ſtrong ſyrup with one pound of ſugar. Then throw in two pounds of almonds, which ſtir well with a ſpatula, for fear they ſhould ſtick to the pan till they have conſumed all the ſugar; then place them over a ſmall fire to diſſolve all the little knobs of congealed ſyrup which remain about the pan, and ſtir it till there is none left, and all ſhould abſolutely ſtick to the almonds. Have a great care that they ſhould not turn into oil, and take notice when they pop, becauſe it is a ſign they are done. Take the pan from the fire, and cover them with a cloth; and when cold, put them in boxes.

XLVI. *To*

XLVI. *To whiten cherries, currants, raſpberries, grapes, ſtrawberries, and ſuch like fruits.*

Beat one or two whites of eggs with orange flower-water, then ſteep your fruit in, and roll it afterwards in a diſh wherein there is lump ſugar pulveriſed and ſifted very fine. When it is well covered over with ſugar, put it on a ſheet of paper, and ſet it in the ſun to dry it. You may thus ice all ſorts of fruits ſuſceptible of icing.

XLVII. *To make ice maroons.*

Slit the bottom ſkin of cheſnuts, and looſen it without peeling them yet, then throw them into boiling water. When you think they have boiled ſufficiently, take a few of them and try whether or not a pin gets eaſily into them by the ſlit you have made. If it do, take the maroons from the fire, then peel them one after another as expeditiouſly as you can while ſtill burning hot, and put them in a dry ſieve. In the mean while, boil ſome new water, and when all are peeled, put them into it, to make them throw all their reddiſh liquor without putting them any more over the fire, but only into the boiling water which you juſt took out; when they have well cleanſed themſelves in this water, take them off with a ſkimmer and put them in a light thin ſyrup, in which boil them gently for ten minutes, then take them off the fire, let them reſt ſo that they may take the ſugar, then ſkim them out of it, and put them in a ſieve to drain. Now add ſome more clarified ſugar to your thin ſyrup, which boil together to a ſtronger one: then put your maroons in, one by one, ſet them on the fire again, and boil all till the ſyrup comes to be what confectioners call *a-la-plume*. Then take them off the fire, and let them reſt. Some time after, take a ſpoon, ſtirring it on one ſide of the pan ſo as to cauſe a thick and muddy look in the ſyrup no farther than the width of your hand. While the ſyrup looks thus, take your maroons gently one by one between two forks, and ſauce them well in that thick part of the ſyrup, then put them on a ſieve over a diſh.

XLVIII. *To*

XLVIII. *To make the* royal maſſepins.

1. Take one pound of ſweet almonds, which throw in a bowl filled with boiling hot water, to help the peeling of them. In proportion as you peel them, throw them into another bowl filled with cold water. Then drain them, and pound them in a mortar, watering them at the ſame time ſo as to make them into a kind of paſte. Now put in the preſerving pan one pound of ſugar with a ſufficient quantity of water to diſſolve it. Boil it to *a-la-plume*, and then take it from the fire to dilute your paſte into it. Set the pan again on the fire, and turn your paſte over and over till it quits the pan freely without any adheſion at all. When paſſing your hand on the paſte, you ſee it ſmoothening without ſticking to your fingers, it is a proof that it is done. Now take it from the fire, and dreſs it with your ſpatula on ſmall boards covered with ſugar, in the form of ſmall oblong cakes of what ſize you like.

2. When the paſte is all dreſſed in that form, let it grow quite cold. Then take one cake after another, and give each of them half a dozen ſtrokes of the peſtle in a mortar to render that paſte more delicate, adding alſo as you pound it thus, half the white of an egg *per* pound of paſte. You may likewiſe introduce in the paſte, while you pound it, a little orange or lemon peel preſerved. Then roll it again in the pulveriſed ſugar, and dreſs it again on the ſame boards as before, either in oblong cakes or in round rings. When done take and ſteep it in whites of eggs beaten with orange flower-water; and draining it well when you take it out, roll it again in pulveriſed ſugar, then put it on a ſheet of paper. When every one has thus been worked all through this proceſs, put the ſheet of paper thus loaded with theſe *maſſepins*, in an oven, moderately hot to give them only a very faint colouring.

3. They who want their *maſſepins* to taſte of the bitter almonds, may introduce one quarter of a pound of bitter almonds among the pound of ſweet ones, from the very beginning, and for the reſt, proceed as directed from the time of peeling.

XLIX. *To*

XLIX. *To make Savoy biſcuits.*

1. Separate the whites of four eggs from their yolks. Beat them by themſelves to a very hard froth, at which time put the yolks previouſly well diluted, and continue beating all well together. Now introduce half a pound of ſugar pulveriſed, and beat them all together again.

2. When you are ready to dreſs your biſcuits, have a quarter of a pound of ſuperfine flour, which incorporate by beating well, then dreſs it on a ſheet of paper in the form you like beſt, and ice them over with ſugar in powder to prevent their running. Put them in an oven, no hotter than for maſſepins; and after a reaſonable time they will be done.

L. *To make bitter almond biſcuits.*

Pound in a mortar three quarters of a pound of bitter and one quarter of ſweet almonds. When thus pounded, have eight or nine yolks of eggs, which beat up and mix with your paſte of almonds, and two pounds of pulveriſed lump ſugar. This paſte muſt be a good deal harder than that of the Savoy biſcuits. Then with the end of a knife taking ſome of that paſte, place it in rows on a ſheet of paper, in what form or ſhape you like, and ice it with pulveriſed ſugar; then put it in the oven as you do the Savoy biſcuits or maſſepins.

LI. *To make* meringues.

Beat well into a hard froth, four whites of eggs: then introduce in them four large ſpoonfuls of ſugar into a ſubtile powder, and a tea ſpoonful of orange flower water, with a little muſk and amber prepared. Put this paſte on a table, and roll it with a rolling pin to the thickneſs of a crown piece. Cut it in the form and ſize you like, bake it half way, or little more, and take it out. Make a ſtrong icing with the white of an egg, ſugar pulveriſed, and the juice of a lemon, in order to whiten that ice, which thicken as a ſtrong pap by means of the ſugar in powder, ſteep your pieces of cut paſte one by one,

one, and ſet them to dry under the lid of the ſtove covered with fire, on the top of it.

LII. *The ſame with cinnamon, or chocolate.*

The *meringues*, with chocolate, or cinnamon, are made as follows. Pound and ſift into ſubtile powder and diſtinctly each by itſelf the cinnamon, and a quantity of the above deſcribed paſte, after a thorough drying. Then mix theſe two powders and a diſcretionable quantity of eggs beaten, continuing to pound the whole till the paſte be firm and however flexible. Now ſpread it with the rolling pin to the thickneſs you like, and cut it in the ſhape and form you pleaſe, then bake and ice it as uſual. If you will not have your *meringues* too hard, bake them on one ſide only, and ice them on the other with orange flower-water and ſugar. When you dry them, let it be with the lid of the ſtove, and take care not to make the fire too ſtrong, leſt it ſhould blow the ice. When properly dried, the ice is as clear and tranſparent as real glaſs.

Note. With the chocolate the ſame proceſs is to be obſerved as with the cinnamon.

LIII. *Another way of icing.*

For the ſake of them who in the time of Lent have ſome ſcruple to eat meſſes wherein there enters any thing belonging to eggs, you may contrive the following method of icing. Take ſome gum adragant, which put into a glaſs tumbler with a little common water and orange-flower ditto. When perfectly diſſolved, ſtrain it through a cloth, and uſe it inſtead of whites of eggs for pounding your paſte in the mortar as above directed. Then for the laſt icing, uſe orange flower-water and ſugar, pulveriſed as above.

LIV. *To make gimblettes.*

Suppoſe you take one quarter of a pound of flour, then one ounce and a half of ſugar in powder, will be quite

ſufficient with two or three yolks of eggs and one white only, then a little orange flower-water, with a very little quantity of muſk and amber prepared. Knead all together, ſo as to make a ſtiff dough with it; to obtain which you diſcretionally increaſe the quantity of flour if neceſſary. But ſhould it become ſo ſtiff that you could not manage it to put in rings, then you muſt put in the mortar, and ſ. ften it with a few ſtrokes of the peſtle and a little orange flower. Then ſpin it in rings; which when made, throw into boiling water and give a bubble or two; and afterwards dreſs it on ſheets of paper, and bake it till it is dry.

LV. *To make* biſc·tins.

Boil one pound of ſugar to a ſyrup *a la plume*; then throw in half a pound of flour. Stir quickly all together to make a dough, after having previouſly taken the pan off from the fire, then take this paſte out of the pan and dreſs it on a table, covered with pulveriſed ſugar. Knead it quickly, and pound it next in a mortar with the white of an egg, a little muſk and amber prepared, and orange flower-water. When it is thus kneaded and pounded pretty ſt.ff, make it in·o ſmall balls of the ſize of a ſmall apricot ſtone, then throw them into a pan filled with boiling water. Firſt they fall to the bottom: but as ſoon as they riſe on the top, you muſt ſkim them out of this water, and put them a-draining in a ſieve. Then range them on a ſheet of paper, and place them in the oven to bake and make them take a fine colour.

Note. If, when baked, you find any difficulty in taking them out of the paper, wet a napkin and wring it, then ſet the ſheet of paper on it, ſoon after they will eaſily come off.

LVI. *To make lemon lozenges.*

Take two whites of eggs, which beat with ſome orange flower-water. Then add as much pulveriſed ſugar as they will ſoak up, to make a pretty ſtiff paſte. Introduce alſo the raſpings of lemon peels. All being well incorporated, roll it all into ſmall balls of the bigneſs

neſs of your thumb, which range on a ſheet of paper and flatten afterwards a little, then put them into the oven to bake.

LVII. *How to preſerve orange peels all the year, but eſpecially in May.*

Cut ſome oranges in four quarters and peel them. Then put the peels to ſoak in water for about ten or twelve days: then dry them between two cloths, and put them in a caldron with a ſufficient quantity of honey to half cover them. Boil them thus one minute or two, ſtirring them inceſſantly. Then take them off the fire, and let them reſt till the next day, put them on again, and let boil ten minutes or a quarter of an hour. For ſix or ſeven days repeat the ſame operation, taking great care inceſſantly to ſtir, turn them all the while they are on the fire. On the eighth day change the honey; and in the freſh honey boil them five minutes, then pot them with that new honey in which they boiled laſt, and keep them for uſe, after having added ſome cinnamon, cloves and white ginger, mixed and both reduced into ſubtile powder.

LVIII. *To make a paſte with whatever fruit it may be.*

Take whatever quantity you pleaſe of any fruit, which peel and boil well in water, then ſtrain the juice through a ſieve, or a flannel. Now weigh ten pounds of that paſte of fruit, and ten more of ſugar pulveriſed. Mix firſt five pounds of ſugar with ten pounds of fruit, and put it a doing on the fire, then mix four more pounds of your ſugar. When done, put with a ſpoon (on iron plates previouſly powdered with ſome of the ſugar which was left) ſome of that paſte. Set theſe to dry on a chafingdiſh, in the ſun, or in the open air, turning and returning them often, and powdering them morning and evening with ſugar. When theſe little cakes are perfectly dry, put them in Dutch deal boxes and in white papers, that they may not touch each other.

Note. In the ſame manner you may make the conſerve of roſes, bugloſs, burrage, red currants, &c.

LIX. *The Genoa paſte.*

Take equal quantities of quinces and odoring apple pulp. The pulp is prepared thus: peel theſe fruits, and clear them of their kernels. Then pound them in a mortar with roſe water, and ſtrain them through a ſieve. Put the paſte on the fire to dry by degrees, ſtirring it all the while with a wooden ſpatula. Then add as much ſugar in powder as you have pulp, and go on in doing it, till it has acquired the conſiſtence of a paſte.

LX. *Quinces jam, and other fruits.*

Boil in a ſufficient quantity of water, both the fleſh and the peelings of your fruits to perfect ſoftneſs. Then let the decoction clarify in the ſun, when ſettled, decant it, and adding to the liquor the proper quantity of ſugar, boil it to a jelly.

LXI. *Genoa biſcuits.*

Take four ounces of ſugar in powder, one pound of flour, a little coriander and aniſeeds in powder, which mix with four eggs and as much luke warm water as needs to make a dough of the whole. Bake it in the oven; and when baked, cut it in five or ſix ſlices, which you bake again.

LXII. *The queens cakes or biſcuits.*

Take twelve ounces of flour, one pound of fine ſugar in powder, and twelve eggs, from which take out three yolks, with coriander and aniſeeds. Beat and mix all together, till it comes to a thick but running paſte. Some add yeaſt to make it lighter and riſe higher. Divide this paſte into ſeveral paper caſes, of the width of two fingers, and twice as long, which put in an oven to bake: but take care that it be not too warm.

LXIII. *Macaroons.*

Pound well one pound of ſweet almonds, moiſtening them with roſe water. Introduce one pound of ſugar, and

and beat all well in a ſoft paſte, which put round a diſh, and half bake in a lukewarm oven. When the paſte is half done, cut it in ſmall round pieces, and having ranged them on a ſheet of paper, finiſh baking them.

LXIV. *Particular method of making cakes.*

Waſh and clean well a dozen of eggs, and wipe them thoroughly dry. Then break them and take their whites only, which beat in a mortar along with their ſhells till theſe latter be perfectly diſſolved. Now add ſugar and flour, though not ſo much flour as ſugar. When all is well mixed, ſpread the paſte, which ought to be a little firm, on a ſheet of paper; and after having glazed it, bake it in a ſlow oven.

LXV. *A cream which cuts as a rice pudding.*

Beat in a diſh two whites of eggs and one yolk, in which, while you beat, introduce by degrees one quarter of a pound of ſugar in proportion as it melts, and a pap ſpoonful of roſe water. When that is compleated, pour in the diſh, and ſtir, a quart of milk and cream mixed half and half, then ſet it gently on warm cinders to take without boiling, not diſturbing it any more. In one hour's time it generally is ſufficiently taken. Then colour it in paſſing a red hot ſhovel over it. It is to be ſerved cold, after having raſped ſome ſugar on it.

LXVI. *To make an exceeding good boiled cream.*

Take cream from the cow, which boil with a crumb of ſtale bread, raſped very fine, and a little freſh butter. As ſoon as it begins to quake, ſtir it continually with a ſpoon; and having diluted ſome yolks of eggs, ſtrain them through a cloth. Put as much ſalt and ſugar in your cream as you think it may require. And when it boils and begins to riſe, pour the yolks of eggs in, never ceaſing to ſtir it in order to prevent its riſing ſo far as to run over. As ſoon as you ſee it begins to render the butter, take it out of the fire; and to ſerve it, glaze it over with ſugar in powder.

LXVII. *To make whipped cream.*

Take one quart of good ſweet cream, in which add one or two ſpoonfuls of orange flower-water, and a quarter of a pound of ſugar pulveriſed very fine. Whip it with a handful of fine white and dry willow twigs tied together on purpoſe. In proportion as it comes to a froth, take it and put in a bowl, or diſhes, to ſerve it on the table.

§ II. Of Summer compottes, or ſtewed fruits.

LXVIII. *The raſpberries compotte.*

Boil half a pound of ſugar into a ſyrup to *a la-plume* degree, in which throw one pound of raſpberries well picked, clean and whole. Take the pan off from the fire, and let all reſt. A little while after, ſhake the pan gently in which the fruit is, and ſtir it a little, then ſet it again on the re to boil five minutes; after which, take it off again and let it cool. Forget not to ſkim the fruit well when in the pan. Currants admit of the very ſame preparation, and by the ſame proceſs.

LXIX. *The apricots compotte.*

Make a lye with pearl aſhes; and when that lye ſhall have boiled five or ſix minutes, put in about a quart of green apricots, which ſtir in gently with the ſkimmer; then take them out and throw them into cold water. Clean them well one by one of all their down, and throw them, as you go on, into another cold water. Then boil ſome water in a preſerving pan, and put them into blanch, till you can thruſt a pin into them eaſily. When this is the caſe, pour them all in a ſieve, and let them ſtrain. Then clarify a pint of ſyrup; and when it boils, put in the apricots and boil them gently in that ſugar for ten minutes. Then take them out, ſtir and ſkim them; let cool and ſerve.

LXX. *To*

LXX. *To make a* compotte *of fruits as above, and even plums* broiled.

Take any quantity of either peaches, plums, or apricots; broil them on all ſides over a chafingdiſh of bright and live coals. Peel them next as faſt as you can, and put them on a ſilver plate with one handful or two of ſugar pulveriſed, and ſufficient water only to help melting the ſugar. Set them next on the fire and boil them one minute or two, then take them out and let cool. When you are ready to ſerve them, ſqueeze the juice of a lemon, or orange, over them.

LXXI. *To make a* compotte *of* perdrigon *plums.*

Take off the ſkin of about two pounds of *perdrigon* plums, which throw in the mean while into cold water, then ſtrain it out and put into boiling one for about two or three minutes only, after which having taken them out of this water and drained, range them in three quarters of a pound of ſugar boiled into a pretty ſtrong ſyrup. When they have boiled eight or ten minutes in it, ſkim them, let cool them and ſerve.

Note. The *lit-de-verd*-plums are made in the ſame way. Whenever a plum is not ripe enough, you may let it do a little longer in the water in which they are boiled previous to the ſyrup, taking care however they ſhould not come to maſh in it.

LXXII. *The ſame for* mirabelles, *purple and black damaſk* Sainte-Catherine *and other plums.*

Take any quantity of the abovementioned plums, we ſuppoſe two pounds. Paſs them in the boiling water without peeling them, eſpecially the *mirabelles*, then put them in a ſyrup of half a pound of ſugar, and finiſh them like the *perdrigons.*

LXXIII. *Compottes of* verjus *in grain.*

Take a pound or two of *verjus* in grain and the fineſt you can find; ſtone it carefully with the point of a tooth-

pick, and throw it in the mean while into cold water. When all is done, take it out with a ſkimmer, and put it into boiling water. Then take it out from the fire, and let it cool. Skim it out again and put it in a ſyrup of one pound of ſugar, in which boil it gently over a ſlow fire; and when the *verjus* begins to turn green, finiſh it quickly like the other *compottes*, but take great care not to do the ſyrup too much.

LXXIV. *Compottes of peeled* verjus.

Take the ſkin and the ſtones out of two pounds of *verjus*, and put it in a bowl, in proportion as you do it. Then clarify one pound of ſugar, which boil into a ſyrup to *a-la-plume* degree, and put in the peeled *verjus*, which boil alſo till you find it ſufficiently done. Take care not to do it too much in ſyrup for fear it ſhould turn black.

Note. Muſcadine grapes may be done juſt in the ſame manner.

LXXV. *Compottes of early pears called* muſcat.

Peel two pounds of thoſe pears, ſcrape their tails, and cut off the end of them. As you prepare them, throw them into cold water. When done, take them out and drain them. Then put them in boiling water, and, when they are ſoftened and almoſt done, take them out of that water to put them into cold again. When they have been there a while, take them out to drain, and put them afterwards in one pound of ſugar boiling, leave them till the ſyrup be almoſt compleated: then remove the pan from the fire, ſtir and ſkim them. Add the juice of half a lemon; then let cool and ſerve them.

Prepare in the ſame manner the ſorts of pears called *Rouſſelet*, *Martin-ſec*, *Jargonelle*, and *Blanquettes*. But as they are larger than the *muſcat*, you may blanch them, that is to ſay, boil them in water, before peeling. As for the reſt, there is no ſort of difference in the proceſs of making *compottes* of them.

LXXVI. *The compotte of the largeſt ſorts of pears, ſuch as* Beurre, Meſſire-jean, Bergamotte, Vertelongue, Bzidery, Mouille-bouche, Amadotte, Doubleſleur, Bonchretien-d'hyver, Franc-real, *&c. &c.*

Boil in water any quantity of the above-mentioned pears, till they are done. Then peel them, core them, and throw them into cold water. Now melt a quantity of ſugar proportionable to that of your pears, in which you put them and boil to a ſyrup, as for the other ſorts of compottes. When done, take them from the fire, and ſkim them well. Squeeze over the juice of half a lemon, and ſerve them either warm or cold, as you like.

LXXVII. *A compotte of pears* a-la-braiſe.

To do this proceed as follows. Broil your pears over a chafingdiſh of bright and live coals: and when ſufficiently done, place them a moment on the naked coals, that you may peel them the more eaſy and to colour them. Then peel and core them, and put them in a weak ſyrup, in which boil them a little while, but not too much.

LXXVIII. *A compotte of apples* a-la-bouillone.

Cut a few apples into halves and core them. Range them in the pan, and for the quantity of ſix or eight apples, put one pint of water and a quarter of a pound of ſugar. Cover them over and ſet them on the fire to boil; when the liquor is almoſt all waſted, dreſs them on a diſh and ſerve them.

N. B. The compottes of *calvil* apples are made in the ſame way.

CHAP. XV.

Secrets relative to the Art of Preparing Snuff.

I. *How to reduce tobacco into powder.*

UNCORD the tobacco, and ſpread the leaves to dry in the ſun. Then pound them in a mortar, and ſift through a coarſe ſieve to get the coarſeſt powder out of it. As for ſifting, obſerve to do it in due proportion as you pound it, and not to pound much at a time. You may alſo take another method, that of grinding it in one of thoſe ſmall mills which are made on purpoſe for grinding tobacco. By theſe means you may, without much trouble, make it as coarſe and as fine as you like, by ſcrewing tighter or ſlacker the nut.

II. *How to purge ſnuff, and prepare it for admitting of odours.*

Have a ſmall tub pierced with a hole at bottom, which you may ſtop and unſtop with a cork as you want it. In this tub put a very thick and cloſe weaved cloth, which turn over the rim of the tub and fix there by the outſide. Put your ſnuff in it, and pour water over it. After it has ſoaked thus twenty-four hours, unſtop the hole of the tub and let the water drain away, wringing the cloth in which it is to help the expreſſion of the water. Repeat this operation three different times to purge it the better. When this operation is performed, ſet the ſnuff to drying in the ſun. When dry, put it again in the tub in the ſame manner as before, and ſoak it again, not with common water, but with ſome ſmelling ones, ſuch as for example, orange flower water, *eau-d'ange*, &c. Twenty-four hours after let the water run off and drain, then ſet it

it in the ſun to dry as before. In the mean while ſtir and aſperſe it again with ſmelling water. Such is the indiſpenſible preparation abſolutely requiſite to diſpoſe ſnuff to receive the odour of flowers. If you do not care to have it ſo perfectly nice, and ſhould not like to waſte ſo much of it, you may give it but one waſh of the common water. This moderate purgation will do pretty well, eſpecially if, while it is a drying in the ſun, you knead it the more often in proportion with your fragrant waters, and let it dry each time between.

III. *How to perfume ſnuff with flowers.*

The tuberoſe, the jeſſamine, the orange flowers, &c. and thoſe which communicate the more eaſily their fragrancy to the ſnuff. To produce this, have a box lined with white paper perfectly dry, in which make a bed of ſnuff of the thickneſs of an inch, then one of flowers, another of ſnuff, and another of flowers again, continuing ſo to do till you have employed all your ſnuff. After having let this ſtratification ſubſiſt for twenty-four hours, ſeparate the flowers from the ſnuff by means of the ſieve, and renew the ſame ſtratification again as before with new flowers. Continue thus to do till you find that your ſnuff has acquired a ſufficient fragrancy from the flowers: then put it in lead boxes to keep it.

IV. *Another way to do the ſame.*

Incloſe their flowers between ſheets of white paper filled with pin-holes as thick as poſſible; this bed lay between two of ſnuff; and, as for the ſmall quantity which may have got in the papers through theſe holes, ſift it out by means of a ſheer horſe-hair ſieve. The flowers muſt be renewed four or five times. This method ſeems the leſs troubleſome, and the ſnuff catches the odour nearly as well.

V. *Another method.*

A preparation of ſnuff may be made of an exceſſive

nice fragrancy with buds of roſes. The proceſs is this. Rob thoſe buds of their green cup and the piſtillum which is in the middle, inſtead of which, ſkilfully introduce a clove without damaging and breaking or looſening the roſe-leaves, which are cloſely wrapped up one in another. Such buds, thus prepared, put into a glaſs veſſel well covered over with a bladder and a leather beſides, and expoſe them for a month in the ſun, after which term make uſe of theſe buds as before-directed for the other flowers.

VI. *Snuff of* mille-fleurs.

The *mille-fleurs*, or ſnuff of one thouſand and one flowers, is made by mixing together a number of various odoring flowers, managing the quantity of each of them according to the greater or leſſer degree of fragrancy they are empowered with, ſo that none could be found to have a predominancy over the others. When that is executed, you proceed, as before directed, to the alternate ſtratification of this mixture and of the ſnuff powder.

VII. *The odoring ſnuff after the method practiſed at* Rome.

Take the ſnuff after its being perfumed with flowers, and put it in a large bowl or other proper veſſel. Pour over it ſome white wine, with an addition of eſſences of muſk and amber, or any other ſuch like odours. Then ſtir your ſnuff and rub it all between your hands. In this manner you may have ſnuff of whatever odour you deſire, which, to diſtinguiſh from each other, you put into ſeparate lead boxes with a particular mark.

VIII. *The ſnuff with the odour of civet.*

Take a little civet in your hand with a little ſnuff; ſpread that civet, more and more in bruiſing with your fingers, and an addition of ſnuff. After having mixed and remixed it thus in your hand with the whole quantity of ſnuff, put all again together in its box as before. You may do the ſame with reſpect to other odours.

IX. *Amber*

IX. *Amber-ſnuff.*

Heat the bottom of a mortar, and pound in it twenty grains of amber, adding by degrees one pound of ſnuff to it, which rub and mix afterwards with your hands, to introduce the odour the better among it.

X. *The odoring ſnuff, Maltheſe faſhion.*

Take a ſnuff ready prepared with orange flower-water (as directed art. ii.) then perfume it with amber as we have juſt ſaid; after which with ten grains of civet, pound with a little ſugar in a mortar, introduce again your ſnuff, by degrees, to the quantity of one pound for theſe ten grains, increaſing either the ſnuff or the odours in the ſame proportion to each other.

XI. *The true Maltheſe method of preparing ſnuff.*

Take roſe tree and liquorice roots, which peel, and reduce them into powder and ſift it; then give it what odour you like, adding white wine, brandy, or ſpirit of wine, and mix your ſnuff well with this. Such is the true Maltheſe method of preparing ſnuff.

XII. *The Spaniſh method of preparing perfumed ſnuff.*

1. Pound in a ſmall mortar twenty grains of muſk with a little ſugar. Add by degrees as much as one pound of ſnuff to it: then pound ten grains of civet, and introduce your pound of muſked ſnuff to it in a gradual manner as before, and rub all together between your hands.

2. The Seville-ſnuff is the ſame with only an addition of twenty grains of *vanilla*, an ingredient which enters in the compoſition of chocolate.

3. They who are fond of a milder and ſweeter odour in their ſnuff may increaſe the quantity of ſnuff for the preſcribed doſes of odours; or diminiſh the doſes of odours preſcribed for the quantity of ſnuff. You muſt take great care not to let odoring ſnuff be uncovered in the air, but to keep it very cloſe for fear it ſhould loſe its fragrancy.

4. As the Spaniſh ſnuff is exceſſively fine and drawing towards

towards a reddiſh hue, to imitate it in the above preſcription you muſt chuſe fine Holland well purged, reddened and granulated, pound and ſift it through a very fine ſilk ſieve. Then give it whatever odour you like, after having purged it in the manner we preſcribed in this chapter, art. ii.

5. There is no inconveniency in taking a ſnuff already prepared with flowers to give it afterwards, when you like, an odour of muſk, amber or other perfume. On the contrary, ſuch a ſnuff is the readier to take the other odours, and preſerve them ſo much the longer.

XIII. *To give a red or yellow-colour to ſnuff.*

Take the bulk of a nut of red or yellow ochre, with which mix a little white chalk to temperate the above colours at your pleaſure. Grind either of theſe ochres with three drachms of oil of almonds; then, continuing to grind it on the ſtone, add by little at a time ſome water to it till you ſee the paſte admits of it freely and becomes very ſmooth and equal. Now take ſome gum adragant water, and introduce it likewiſe to the above paſte, ſtirring continually. At laſt gather it in a large glazed bowl, and dilute it in about one quart of common water, or thereabouts. Then take your ſnuff well purged and prepared as in art. ii. and throw it in this bowl, wherein handle and rub it well to make it take the colour more regularly and equally. When it is thus made all into a lump, let it reſt twenty-four hours before putting it to dry in the ſun, which immediately after ſpreading it on a dry cloth and turning it now and then to help its drying the faſter. Then gum it again by aſperſion with gum adragant pulveriſed and diſſolved into ſome ſmelling water: or you may again dip your hands into that water, and rub your ſnuff between your hands thus wetted; which laſt method is preferable, as it gums the ſnuff infinitely more regular. Laſtly, dry it again in the ſun; and, when perfectly dry, ſift it through the fineſt ſieve you can find, and then it will be ready to admit of whatever odour you pleaſe to impregnate it with.

CHAP.

CHAP. XVI.

Secrets of taking out Spots and Stains.

I. *To take off iron-molds from linen.*

PUT boiling water into a bowl, and ſpread the ſtained parts of your linen over it, as to be well penetrated with the ſteam of the water. Then rub the places with ſorrel juice and ſalt till they are perfectly ſoaked. Such linen waſhed afterwards in the lye of wood-aſhes, will be found to return intirely free from the iron-mold ſpots it had before.

II. *To take off carriage wheel greaſe from clothes.*

Rub the place with butter. Then with blotting paper and a hot iron, you may take all off as you would a drop of wax or tallow on a cloth.

III. *Againſt piſs ſpots.*

Boil ſome chamber-lye and waſh the place with it. Then rinſe it with clear water.

IV. *To take off ſpots from cloth of any colour.*

Take half a pound of crude honey, the yolk of a new laid egg, and the bulk of a nut of ammoniac ſalt. Mix all together, and put ſome on the ſpots. After having left it there a while, waſh the place with clean water, and the ſpot will diſappear.

V. *A receipt againſt all ſorts of ſpots, upon ſtuff.*

A water impregnated with alkaline ſalt, black ſoap and

and bullock's gall, take off extremely well the greaſy ſpots from any cloth or ſilk ſtuff.

VI. *Againſt oil-ſpots.*

Take a piece of white ſoap, ſhaved very fine, and put in a quart bottle with a wide mouth and neck, half filled with lye. Add to this the bulk of a nut of ammoniac ſalt, two yolks of eggs, cabbage juice and bullock's gall a diſcretionable quantity, one ounce of ſalt of tartar in ſubtile powder ſifted. Stop the bottle well, ſhake it and expoſe it to the ſun for four days. After that time, if you pour off that liquor on any oil ſpot, and rub it well with it in and outſide, then let it dry, and waſh it again with clear water.

VII. *A waſhing ball to take off ſpots.*

Take fuller's earth, or ſoft ſoap incorporated with vine bruſh aſhes, white chalk, alum and tartar, pounded all together in a mortar and ſifted through a fine ſilk ſieve. When all is made into a paſte, form your balls with it, and let them dry in the ſhade. To uſe them, rub any ſpotted place with it, and waſh it afterwards with clear water.

VIII. *To take out pitch and turpentine ſpots.*

Rub well the ſpot with oil of olive, which ſet to dry for one day. Then, with warm water and the above waſhing ball, you will intirely ungreaſe the place.

IX. *Againſt ink ſpots, whether on cloth or linen.*

Wet immediately the place with lemon, or ſorrel juice, or with white ſoap diluted in vinegar.

X. *Another ſimple remedy againſt ink when juſt ſpilled.*

☞ The time ſpent in lamenting over an accident juſt happened, is but too often the only one which could have ſaved

ſaved and prevented the dire conſequences of it, nay perhaps repaired it intirely without leaving the leaſt ſcar behind, had we ran inſtantly to the remedy. If the ink be ſpilled on a ruffle or apron, &c. while you have it on, let one hold the affected part between his two hands over a baſon, and rub it while another is pouring gradually water from a decanter; and let a whole pitcher full be uſed if neceſſary. If the ruffle, apron, &c. be at liberty and not actually worn on, the place dipped into a baſon filled with water, and there ſqueezed and dipped in again, may do, provided you change the water in abundance, every two or three ſqueezes. If the ink be ſpilled on a green carpet table, it may immediately be taken out with a tea ſpoon ſo dexterouſly that any water at all ſhall hardly be wanted afterwards, provided it was only that inſtant ſpilled; as the down of the cloth prevents the immediate ſoaking of the ink or any other liquor (except oil) but if it has laid ſome time, let the time be ever ſo long, provided it is ſtill wet, by pouring a little freſh clean water at a time on the place, and gathering it up each time with a ſpoon, and preſſing hard to ſqueeze it out of the cloth into the ſpoon again, you will at laſt bring it to its natural colour, as if no ſuch accident had ever happened.

XI. *Againſt oil ſpots on ſatin, ſilk ſtuffs, or paper.*

If the ſpot is freſh done, heat on the ſhovel ſome aſhes from calcined ſheep's trotters, and put ſome under and upon the place. Then laying ſomething heavy upon it, let it remain for one night; the next morning the ſpot ought to be gone; but if not quite, renew the precept.

XII. *A preparation of balls againſt ſpots.*

Take half a pound of ſoap, four ounces of clay, and one of quick lime. Dilute all with a little water, and make it into pills or ſmall balls. With theſe rub the ſpots, and waſh the place afterwards.

XIII. *For ſilks.*

If you rub the ſpots which are upon a ſilk with ſpirit of turpentine, they will diſappear; becauſe the volatility of

of that ſpirit exhaling into vapour, carries along with it the oil of the ſpot to which, on account of its homogeneous quality, it communicates its volatility, by penetrating and ſubdividing it infinitely.

XIV. *To reſtore gold and ſilver laces to their former beauty.*

Mix equal quantities of water, bullock's and jack's gall. With this compoſition rub your gold or ſilver, and you will ſee it changing colour directly.

XV. *To reſtore Turkey carpets to their firſt bloom.*

Beat the carpet well firſt with a rod, till perfectly free from duſt. Then if there be any ſpots of ink, take them out with a lemon, or with ſorrel; and waſh the place afterwards with clear water. Shake the reſt of the water off, and let it dry, rub the carpet very hard all over with the ſmoaking hot crum of a white loaf: and when you find in the evening the ſkies clear, and a likelihood of being a fine night, let the carpet be put out for two or three ſuch nights.

XVI. *To make tapeſtries reſume their firſt brightneſs, when their colours have been tarniſhed and ſpoiled.*

Shake and clean well the tapeſtry by rubbing it all over with white chalk, which leave on it for about one day. Next with a rough hair bruſh, get all that chalk out again, and put on freſh, which leave as before. Then with the ſame rough hair bruſh get this out alſo, and beat it ſoundly with a rod, and bruſh it afterwards with the ſoft cloth-bruſh. This operation will reſtore a tapeſtry to its priſtine ſtate.

XVII. *To take off ſpots of wax from velvet of any colour, except the crimſon.*

Take the crumb of a ſtale loaf, and cut a thick ſlice out of it, which toaſt, and apply, while burning hot, on the ſpot of wax; when cooled, renew it till all the wax is ſoaked out of the velvet.

XVIII. *To*

XVIII. *To take the ſame from ſilks and camblet.*

Put on each wax ſpot, ſome ſoft ſoap, and ſet it in the ſun till grown warm; then by waſhing the place with clean water, the ſpot will diſappear.

XIX. *To waſh a gold or ſilver, or ſilk embroidery, or any ſtuff whatever, and render it like new.*

Take bullock's gall, one pound; ſoap and honey, three ounces of each; and Florentine orrice, about the ſame quantity in ſubtile powder. Put all in a glaſs veſſel, in which mix it well, into a paſte, and let it be expoſed for ten days in the ſun. When you are ready to uſe it, make an infuſion of bran, which boil in water and ſtrain through a cloth. Then ſmear the work over with the above-deſcribed paſte, in ſuch places as you want to clean, and waſh them afterwards with the ſaid bran water, renewing this till it receives no more alteration in its colour. Wipe then well the places with a white cloth; and wrap the work in a clean napkin to ſet it in the ſun to dry, after which paſs it through the poliſhing and luſtring preſs, and the work will be as fine and bright as when new.

XX. *To take the ſpots off from ſilk and woollen ſtuffs.*

Take French ſtarch, without any mixture of indigo or blue whatever, which dilute in a cup with good brandy like a thick pap. Of this paſte, put on each ſpot, and when dry, rub it off and bruſh it. If the ſpot is not quite gone at the firſt time, renew the operation, and it certainly will at the ſecond.

XXI. *To colour velvet in red.*

Take four ounces of adragant, and one of arabic gums, both of which pulveriſe. Put this powder in clean water, wherein let it diſſolve for two or three days. After which time, ſteep a ſponge in the liquor, and rub the wrong ſide of the velvet. If after being dry, you find it not high-coloured enough, renew it, and the effect will ſurpriſe you.

XXII. *To*

XXII. *To revive the colour of a cloth.*

Pour one quart of water on one pound of burnt potaſhes. Twelve hours after decant the water off in another veſſel, and put in a handful of dry moth mullein leaves, with two bullock's galls. Boil all together till the leaves go to the bottom. Then ſet this water for a few days in the ſun. Then putting in it whatever colour you want, boil it along with the cloth in that lye, and let it thus ſoak afterwards for fourteen or fifteen days, then the cloth will have reſumed its primary colour.

XXIII. *To take the ſpots off from a white cloth.*

Boil two ounces of alum for half an hour, in a pint, or a pint and a half of water; then put in a piece of white ſoap, with another pound of alum; and having ſoaked thus three days in the cold, you may with it waſh all the ſpots of any white cloth whatever.

XXIV. *To take off the ſpots from crimſon and other velvets.*

1. Take one pint of lye made of vine branch aſhes, in which diſſolve half an ounce of alum dregs. When ſettled, ſtrain it through a cloth; then take another drachm of alum, half a drachm of Spaniſh, and as much of ſoft ſoap; a ſcruple of common, and half a drachm of ammoniac ſalts; a calf's gall, and a little calendine juice. All being well mixed, ſtrain and keep it for uſe.

2. Before uſing, take the quantity you think to have need of in a cup, in which put a little brazil wood and *bourre d'ecarlatte* (or goat's hair from the dyers, dyed with madder) to boil a bubble or two, then ſtrain through a cloth. In that ſtate, your preparation will be fit to take off all the ſpots from crimſon, either cloth or velvet.

Note. For cloths or velvets of other colours, tinge your liquor with *bourre*, or goat's hair, of the ſame colour.

XXV. *To take off an oil ſpot from cloth.*

Take oil of tartar, which put on the ſpot, then waſh it immediately, firſt with lukewarm water, then with two or three cold waters, and it will be perfectly cleanſed.

XXVI. *A*

XXVI. *A compoſition of ſoap to take off all ſorts of ſpots.*

1. Take one pound of *Venetian* white ſoap, ſix yolks of eggs, and half a ſpoonful of ſalt pounded. Incorporate all together with a ſufficient quantity of the juice from the leaves of white beet. Make this compoſition into ſmall cakes, which dry in the ſhade.

2. To uſe them, wet the place of the cloth where the ſpot is, with clear water, and rub it over on both ſides with the ſaid ſoap; then waſhing it, the ſpot will diſappear.

XXVII. *To take the ſpots from a white ſilk or crimſon velvet.*

Wet the place well with brandy of three rectifications, or with the very beſt ſpirit of wine, then ſmear it over with the white of an egg, and ſet it to dry in the ſun. When dry, waſh the place with clean water, paſſing and ſqueezing it between your fingers; and if the ſpot is not gone at the firſt operation, it will not fail at the ſecond, therefore renew it again.

CHAP. XVII.

SECRETS Relative to the ART of FISHING, BIRD-CATCHING, *&c.*

I. *How to entice a great quantity of fiſh to reſort to a certain place.*

YOU may draw all the fiſh into whatever place you find moſt commodious, by throwing in the following compoſition.—Take bullock's, goat's, and ſheep's blood, which is found in curds among the entrails in the body

body of the animal freſh killed, thyme, origan, flour, marjoram, garlick, wine-lye, and ſome ſuet or marrow of theſe ſame animals. Pound well all theſe ingredients together, and make them in ſmall pills, which ſcatter in that place of the river or pond where you wiſh to have the fiſh come.

II. *Another receipt to the ſame purpoſe.*

Pound nettles with *joubarbe*, and ſome of that graſs called *quintefolium*; add ſome wheat boiled in marjoram, and thyme water well pounded alſo with the reſt. Put of that compoſition in your net, and it will ſoon be full.

III. *Another way.*

Grind together coculas Indicus, cummin and ſome old cheeſe, make a paſte of it with wine lye and wheat flour. When all is well incorporated, make it into pills of the ſize of a pea. Throw them into a river or pond wherein you know there is a great quantity of fiſh, in a part where the water is clear and undiſturbed. Every fiſh who ſhall ſwallow thoſe pills will be ſo intoxicated that they will all come to the ſide of the water, and you will be able to take them with your hand. In a ſhort time afterwards their intoxication will go off, and they will become again as brisk as ever they were before eating that bait.

IV. *Another way.*

Marjoram, marigolds, wheat flour, and rancid butter, goat's ſuet, and *lumbrici terreni*, (or earth worms) pounded and mixed all together, are of infinite ſervice to intice all ſorts of fiſh in the net.

V. *How to get a good many birds.*

Have an owl or chough, which tie in the night to a tree in the foreſt. Near him place a large lighted candle, which ſhall blaze very much. Then let two or three people make a noiſe about the tree with drums. The birds will come in crowds to rooſt near the owl, to make war againſt him, and you will thereby have an opportu-

nity

nity to kill numbers of them, by firing in the midſt of them with ſmall ſhot.

VI. *Another way.*

Put a-ſoaking ſome birds ſeed in good brandy, with a little white hellebore, and place it in ſome part of your garden as a bait for the birds which frequent it; and all thoſe who ſhall eat of that ſeed will ſo ſuddenly be intoxicated by it, that they will ſuffer themſelves to be taken by the hand.

VII. *Another way.*

If you want to catch live ſwallows or crows, make papers in the form of a ſugar loaf, with ſome ſtrong brown or blue paper, the entrance of which rub in the inſide with bird-lime, and bait at the bottom with ſome ſtinking piece of meat or carrion to intice them. By theſe means, when they go to thruſt their heads in theſe papers, to take the meat, the lime catches hold of their feathers, all about their neck and head, and caps them in ſuch a manner that they find themſelves blinded, and cannot fly, when they go to riſe for it, which gives an opportunity of taking them alive with the hand.

VIII. *Another way.*

Mix a little *nux vomica* among the ſeed, which lay as a bait for birds. As ſoon as they ſhall have eat any of it they will fall into a ſwoon, and it will be eaſy to lay hold of them with the hand.

IX. *To preſerve and multiply pigeons.*

In a large dovecote, prepare the following food, which will induce your pigeons to love their cote, and alſo to bring you a great many ſtrangers when they go abroad.—Take thirty pounds of millet, three of cummin, five of honey, half a pound of biſhop's-wort, otherwiſe *coſtus*, two pound of *agnus caſtus* ſeed, which boil in river water to the total evaporation of the laſt. Then in its ſtead pour

pour a gallon and a half, or two gallons of red Port, with about eight pounds of old mortar well pulverised, which set on the fire again for about half an hour to concoct. Thus all those ingredients will harden and form a lump, which if placed in the middle of the dovecote, will in a short time amply reward you for your expence.

X. *Another for the same purpose.*

If you hang in your dovecote a couple of the oldest stinking and dry salt cod-fish, you will by this means not only keep your own pigeons safe at home, but also cause a desertion among all those of your neighbours; for the smell of that fish, of which they are excessively fond, will reach them many miles off.

XI. *How to fatten pigeons.*

Experience shews that nothing will keep pigeons in better order, and fatten them sooner, than a paste made of fried beans with cummin and honey.

CHAP. XVIII.

SECRETS, entertaining and useful.

I. *To whiten wax.*

MELT it in a pipkin without boiling. Then take a wooden pestle, which steep in the wax two fingers deep, and plunge immediately into cold water to loosen the wax from it, which will come off like sheets of paper. When you have thus got all your wax out of the pipkin, and made into flakes, put it on a clean towel, and expose it in the air on the grass till it is white. Then melt it again, and strain it through a muslin to take all the dirt out of it, if there be any.

II. *Another*

II. *Another of whitening wax in large manufactories.*

1. Melt your wax in a large copper, ſuch as brewing or waſhing coppers fixed in mortar; have a kind of trough, made of oak or deal, and ſix or ſeven feet long, at the farther end of which a cock of cold water will be placed in the wall to fill it, and at the other, towards the copper, a tub laid upon it, to receive the wax from the copper. Let that tub have alſo a cock at four fingers breadth from the bottom, and in that tub pour the melted hot wax from the copper. Cover it with a blanket in four doublets to make it retain its heat, and let it reſt thus a couple of hours to give time to the dirt and naſtineſs, which may happen to be in it, to ſettle at the bottom of the tub. When that is done, fill your trough with cold water; then have a kind of tin baſket to fit the width of the trough ſo as to ſit upon its edges, and bored at bottom with twelve or ſixteen ſmall holes, at equal diſtances, ſo as to receive the melted wax from the cock of the tub, and render it in the trough through the ſaid ſmall holes of its bottom, while with a poliſhed wooden ſtick or roller, under the tub, and armed at both ends with iron in the form of a ſpit, and half of the thickneſs of which enters into the water, while the other keeps above it, you keep continually turning equally and regularly. This proceſs will make the wax flake in the water into ſmall ribbons as thin as ſilver paper. Now in fine clean hampers, or hand baſkets, made of white peeled willow twigs, take your wax from the trough with a wooden ſhovel, and carry it to an open field, where lay it thick upon a coarſe cloth in the ſun, and turn it every other day for two weeks running, after which time it will be of a very perfect whiteneſs.

2. Now clean well your copper, and put in alum water to warm, in which throw your whitened wax, and ſtir well. When melted, renew the operation as before, and carry it again in the open field to expoſe it in the ſun. In a week's time it will have its whiteneſs in the higheſt degree it can be carried to.

3. Melt it then for the laſt time, and put in ſmall

round cakes, which is done by casting it in small moulds carved purposely on several boards.

III. *How to multiply wax.*

Take bullock's suet, which pound well, and put a-soaking for seventy-two hours, in the strongest French wine-vinegar, then boil afterwards for forty-eight hours, keeping perpetually skimming, as long as there appears any scum upon it. When that is done, let it cool a while, and throw it afterwards into a tub of cold water, wherein beat and stir it till it resumes its wonted consistence and firmness. Then put it again into other fresh vinegar, and repeat the very same process three different times. Next to that, gather the tops of rosemary, sage, bay, and mint, which pound and boil well in water, then strain through a double flannel bag. In this water boil for the last time your prepared suet as before, and after it shall have boiled there one hour, it will have no more bad smell. To colour it you must put one drachm of saffron to each pound of suet, and melt it afterwards with an equal quantity of real bees wax, then it will be impossible to discover the mixture.

IV. *To make mutton suet candles, in imitation of wax candles.*

1. Throw quick lime in melted mutton suet; the lime will fall to the bottom, and carry along with it all the nastiness of the suet, so as to leave it as pure and fine as wax itself.

2. Now if with one part of that suet, you mix three of real wax, you will never be able to find out the mixture, not even in the moulding and casting wax for figures or ornaments.

V. *To make soap.*

The white, or as it is called, the *Genoa* soap, is made with wood ashes, *Alicant* kali, lime and olive oil. The black is made of the same materials, with this exception, that

that it is made with the *fæces* and tartar of the oils. The marble is made with *Alicant* kali, *bourde*, and lime; and when it is almoſt done, they take ſome red earth, which they call cinnabar, with copperas; they boil theſe together, and throw it in the copper wherein the ſoap is. It occaſions a blue marbling, as long as the copperas keeps the better of the two ingredients; but as ſoon as the cinnabar has at laſt abſorbed the vitriol, this blue hue ſubſides intirely, and the red alone predominates.—In order therefore to form the ſoap, make different lyes with all theſe ſorts of matters; and when they are ſufficiently charged (which beginners know by their carrying an egg ſwimming, without its ſinking to the bottom, and experienced ſoap-boilers are judges of by dejuſtation, and the time they have been at work) they put all theſe lyes in proper coppers, and pour at the ſame time in *Provence* and *Languedoc*, oil of olive; in *Germany*, greaſe: and in *England*, oil of fiſh. That done, they boil all together with a great blaſting fire; and eighteen or twenty days afterwards theſe oils have ſo well aſpired all the ſalts of the lye, that this is left quite flat and untaſty. Then by the cocks which are at the bottom of the coppers, the water or lye is let out, and the lump of ſoap taken out and placed to dry in houſes built on purpoſe, to make it take a ſufficient conſiſtence.

VI. *To prevent any thing from burning in the fire.*

Pound into powder cherry-tree gum and alum in equal quantities, and imbibe that powder with ſtrong wine-vinegar, which leave thus a digeſting on warm aſhes, for the ſpace of twenty-four hours. If with this compoſition you rub any thing and throw it in the fire, it will not be conſumed by it.

VII. *To prevent burning one's fingers in melted lead.*

Take two ounces of *bol armeniam*, one of quick ſilver, half a one of camphire, and two of brandy. Mix all together with a peſtle in a braſs mortar, and rub your hands with this compoſition, before ſteeping them into

a pot of melted lead, and this will have no effect upon them.

VIII. *A fire which cannot be extinguished by water.*

Take five ounces of gun-powder; saltpetre, three; brimstone, two; camphire, rosin, and turpentine, one of each. Mix all together, and imbibe it with rectified oil of rosiny fir-tree. If you fill balls with this composition, and throw them thirty feet deep in the water, they will burn still, even if you cover them intirely with mould.

IX. *To prevent the oil of a lamp from smoking.*

Distil some onions, and put of the distilled liquor at the bottom of the lamp, and the oil over it, then you will see the oil give no offensive smoke.

X. *To make an incombustible wick.*

Take a long piece of feathered alum, which cut of what size you like, and bore in its length several holes with a large needle; then put this wick in the lamp; the oil will ascend through these holes, and if you light it, you will see the effect of it.

XI. *A stone which is inflammable with water.*

Take quick-lime, refined saltpetre, Alexandrian tutty, and calaminary stone, in equal quantities, with brimstone and camphire, of each two parts. Put all in to subtle powder, and sift it through the finest sieve. Then put all into a new piece of cloth, and tie it very tight. Put this knot into a crucible, which cover with another crucible, and lute well with greasy clay. Let the lute and all be set in the sun, or over a baker's oven, to dry. After which time place these crucibles in a brick kiln, and do not take them out before the bricks are baked. Then you will find a stone, which the least drop of water will inflame, so as to light a match if you put it to it. To put it out, only blow upon it.

XII. *To*

XII. *To make the true* phosphorus, *extracted from urine, which is inflammable by the air, so that pieces of wood may be lighted by it.*

Put a large quantity of chamber lye in bottles, set them in the sun during the dog-days, till the urine become entirely fœtid. In proportion as the urine diminishes by the evaporation the heat occasions, let them be filled again by pouring from the one into the other, but not by any fresh urine. When it is come to its utmost degree of corruption, put it into a glass retort on a sand bath; and, having luted a bladder for receiver, there will arise first a spirit, and next a phlegm. When the distillation is ended, and you see that nothing more arises, let the retort cool, and unlute it to fill it again with urine of the same degree of corruption as the last. Lute and distil again as you did before, first the spirit, and then the phlegm, continuing to unlute, fill again and distil till you find you have got at the bottom of the retort a good quantity of *fæces*.—Observe and be very careful at every distillation not to force the distillation beyond the phlegm. But when it comes for the last time, re-adapt the bladder, and give the gradual rising fire till the oil ascends, in which case, keep up your fire to that degree, and when you see it stops, then is the time to increase your fire, to force out any thing which can be forced and distilled from it. When that is done, let the retort cool, and break it. Therein you will find two sorts of matters; the one rare and spungy, which occupies the upper part, and another under, very nasty and tartareous. Separate carefully, and dexterously, with a wooden knife, or spatula, the uppermost matter from the undermost. Put the spongy one in a new retort, and give a gradual fire on the sand bath. The first which arises will be an oil, which put aside; the next will be a matter not unlike melted sulphur. Then take the oil which first ascended, and mix it with that of the preceding distillation, which pour all together on the residue of this second one, and set it on a very slow fire, to exhaust gently all the humidity from it. Then empty this humidity or phlegm out of the receiver,

and replace it with clear and clean water; and, having re-adapted it to the retort, diſtil all your greaſy and bituminous oil; it will come out like ſtars and ſpangles of fire, which will fall into the receiver. But then is the time to take care and not be too haſty by puſhing the fire too hard, for you would cauſe the breaking of the retort, and loſe at once all the fruit of your labour.—The operation being therefore well conducted throughout, you will find your matter at the bottom of the receiver: break it into ſeveral pieces, put it in a phial with water, and cork it well. Such is the proceſs to be obſerved in making the *phoſphorus* from urine, and which we here publiſh from experience.

XIII. *Fruit.*

To preſerve trees from being injured by worms, caterpillars, &c. Clear away the gum that iſſues out of the tree affected by the worm; ſtrew a little flour of brimſtone around the root, and cover it with fine mould, that it may not be blown away, yet ſo that the ſun may operate through and cauſe the brimſtone to fumigate, which will deſtroy the worm. One pound of brimſtone is ſufficient for near two hundred trees. The ſame kind of ſulphur is deſtructive to caterpillars. Split the end of a pole or ſtick, put therein a few brimſtone matches, ſet them on fire, and hold the pole under the neſt.

XIV. *To kill all ſorts of worms in cattle.*

Take *ſaven*, chop it ſmall, and beat it with freſh butter, make it in ſmall balls, and give it to the beaſt in a proportionable quantity. Sweet wort and a little black ſoap mixed together as a drink, maketh all ſorts of beaſts void the worms.

XV. *To kill maggots in ſheep.*

Take gooſe greaſe, tar and brimſtone, mix them together on the fire, and when cold, anoint the troubled places therewith.

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